CONGESTION MANAGEMENT SYSTEM for Northeastern Illinois

2006 Status Report

July 2006

Chicago Area Transportation Study

CATS WORK PROGRAM COMMITTEE

JACK GRONER, Chairman
Department Head
Commuter Rail Board-Metra

LUANN HAMILTON, Vice Chairman
Deputy Commissioner for Project Development
Chicago Department of Transportation

MICHAEL D. ROGERS
Environmental Protection Specialist
Illinois Environmental Protection Agency

JOHN DeLAURENTIIS
Deputy Executive Director
Regional Transportation Authority

RON THOMAS
Executive Director
Northeastern Illinois Planning Commission

STEVEN STRAINS
Director of Transportation Development
Northwestern Indiana Regional Planning Commission

DONALD P. KOPEC
Acting Executive Director
Chicago Area Transportation Study

ARLENE MULDER
Mayor, Village of Arlington Heights
Representing CATS Council of Mayors

THOMAS B. RICKERT
Assistant Director
Kane County Division of Transportation

BENET HALLER
Director, Urban Design and Planning
Chicago Department of Planning and Development

RODNEY BETTENHAUSEN
Advance Planning Engineer
Cook County Highway Department

CHUCK TOKARSKI
County Engineer
DuPage County Division of Transportation

AL GIERTYCH
Assistant County Engineer
Lake County

DICK SMITH
Director, Office of Planning and Programming
Illinois Department of Transportation

JASON OSBORN
Transportation, Planning and Program Coordinator
McHenry County

BRUCE GOULD
Assistant County Engineer
Will County

FRAN KLAAS
County Engineer
Kendall County

JEFFREY SRIVER
General Manager, Strategic Planning
Chicago Transit Authority

THOMAS A. ZAPLER
Special Representative, Union Pacific Railroad
Representing Class 1 Railroads

JOHN D. RITA
South Suburban Mass Transit District
Representing Mass Transit Districts

PAUL LOSOS
Sunrise Transportation Inc.
Representing Private Transportation Providers

ROCKY DONAHUE
Director of Government Affairs
Suburban Bus Board-Pace

MARY WELLS
Senior Manager of Strategic Planning and Programming
Illinois State Toll Highway Authority

JASON TAI
Director, Division of Public and Intermodal Transportation
Illinois Department of Transportation

CLARITA LAO
Engineer of Program Development
District 1
Illinois Department of Transportation

CHRISTOPHER DiPALMA
Metropolitan Planning Engineer
Federal Highway Administration

VANESSA ADAMS
Community Planner
Federal Transit Administration

PATRICIA BERRY, Secretary
Acting Deputy for Programming
Chicago Area Transportation Study

The Work Program Committee reviews and makes recommendations to the Policy Committee on transportation matters presented to CATS and carries out any other duties the Policy Committee shall assign to it. It coordinates the activities of the committees, subcommittees and task forces reporting to the Work Program Committee.

7/06

Congestion Management System for Northeastern Illinois

• 2006 Status Report •

July 2006

Chicago Area Transportation Study
233 South Wacker Drive, Suite 800
Chicago, Illinois 60606

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Report Summary

A Congestion Management System (CMS) is a process for managing congestion that provides information on transportation system performance and on alternative strategies for alleviating congestion. The CMS Status Report is a "state of the system" report and is produced periodically by CATS to summarize the operating characteristics of the region's transportation system and to highlight key performance trends. This is the third edition of the CMS Status Report, and was preceded by reports in 1999 and 2002. A number of data sources were used to develop this report and are summarized below.

Census Data

The Census Transportation Planning Package is a special set of tabulations taken from the decennial Census "long form" questionnaire to provide data for transportation planners. Traffic is a direct result of the activities people undertake and Census data can inform one about the number of people living in the region, how many of them work, their mode of transportation, and how much time they spent on their journey to work. Major findings from the 2000 U.S. Census are:

- The population of the northeastern Illinois region increased 11.6% between 1990 and 2000 to over 8.1 million people.
- The number of people working in northeastern Illinois increased from 3.6 million to 3.9 million between 1990 and 2000.
- The average commute time to work in the region was 31.6 minutes in 2000, three minutes longer than in 1990.
- Driving alone was the fastest commuting mode in 2000 and it was the most popular, used by 69% of commuters in the region.
- A greater share of commuters in the region started their work trip before 6:00 AM in 2000 than in 1990.

CATS Transportation Opinion Survey

During a series of "Partners in Progress" outreach meetings held throughout the region in 2004 and 2005, meeting participants were asked to fill out the CATS Transportation Opinion Survey to identify their concerns with the region's transportation system. Survey participants were presented with a list from which they could select problems they had observed or experienced in their daily travel. The two most frequently cited general traffic problems were "Traffic Congestion" (selected by 85% of all respondents) and "Roads in Bad Condition" (selected by 59% of all respondents). The two most cited transit related problems were "It Doesn't Serve the Area Where I Live" and "It Doesn't Serve the Places I Need to Travel to", both of which were selected by 32% of all respondents.

Current Expressway Conditions

Past CMS analyses have been hampered by a lack of timely data on travel conditions and the absence of a robust dataset describing current roadway conditions. The current conditions analysis in this edition of the Status Report is based on archived data measured by roadway detectors located on the expressway and tollway system in northeastern Illinois. This information is being made available to public transportation agencies through the federal Intelligent Transportation Infrastructure Program.

Traffic patterns on the expressway system were analyzed using hourly traffic counts from detectors located throughout the region. Weekday traffic patterns consistently showed two peak periods, while weekend traffic patterns showed a single peak that reached its maximum during the mid-afternoon. Hourly traffic volumes on the weekend were found to fluctuate more than hourly volumes during the weekdays.

For this analysis congestion is discussed in terms of specific expressway corridors. Eight corridors were selected to represent expressway travel in the region; they were chosen to characterize different geographic areas in the region. The corridors range in length from 6 miles to 13.4 miles. These corridors will serve to: (1) describe the current travel conditions and (2) serve as a baseline that future data can be compared against.

Corridor traffic operations are described in terms of travel times. Travel times for each corridor were developed using the 5-minute summary speeds recorded for each sensor within the corridor. The average travel time was calculated for each 5-minute period over all of the days of data to develop a profile of the average day of travel. Performance measures used along with travel time include a measure of travel time reliability and the 95th percentile travel time, which indicates the amount of time one would need to allow to be on time 95% of the time.

The conditions for both directions of travel in each corridor are summarized in Section 3.2.2 of this report.

Future Conditions

Statistics from CATS' travel demand estimation models provide for an analysis of expected roadway congestion for the year 2030. These data are compared to estimates for 2005 in order to examine the growth in traffic congestion. The modeled traffic data suggest that daily vehicle miles traveled (VMT) on the region's arterials will increase by about 20% between 2005 and 2030, from 105 to 125 million vehicle miles. The number of congested daily vehicle miles on the arterials is expected to increase from 11.8 million to 16 million during this period. Daily expressway VMT for the region is expected to grow to 54.4 million vehicle miles, an 18% increase over 2005. Nearly 6.4% of daily expressway VMT is expected to be congested in 2030.

Incident Analysis Case Study

The main task of this case study was to examine the detector data around a specific incident on I-90 and to see how the incident was reflected in the data. The objective was to determine the viability of using archived detector data to systematically analyze travel conditions for incident-related congestion. Based on this case study, it appears feasible to use this data to try to assess the impact incidents have on congestion. A proposed methodology is to identify occasions where travel time in a corridor on a specific day exceeds one standard deviation above the average travel time for the corridor. Instances where a minimum specified number of consecutive 5-minute periods meet this condition could be tagged as incident-related congestion.

Other Sources of Congestion Information

Some sources of local and national roadway congestion information are identified. Of particular interest is the website operated by the Gary-Chicago-Milwaukee ITS Priority Corridor partners (www.gcmtravel.com), which includes a good deal of information on real-time traffic conditions for selected highways in the region. A companion website (www.gcmtravelstats.com) allows individuals to perform their own historical travel time analyses using archived traffic data by selecting one of the pre-defined corridors from a drop-down list. Individuals can see a chart plotting the average travel times during the day for the corridor compared to the current travel time. The data analyzed can be limited to specific days of the week or include all days. One can also directly compare the historical travel times of two separate corridors or compare the travel times during two different time periods for the same corridor.

(This page left intentionally blank.)

1 Congestion Management Requirement

A Congestion Management System (CMS) is defined as a "systematic process for managing congestion that provides information on transportation system performance and on alternative strategies for alleviating congestion and enhancing the mobility of persons and goods to levels that meet state and local needs" (23 CFR 500.109). The 1991 Intermodal Surface Transportation Efficiency Act established the CMS, along with five other management systems, and recommended that it be developed and implemented in cooperation with metropolitan planning organizations. Urban areas with a population of at least 200,000 were designated as transportation management areas (TMAs) and were required to have a CMS as part of the transportation planning process. Further, the legislation stipulated that any federally-funded transportation project that significantly increased the capacity for single-occupant vehicles in a TMA not in attainment for national air quality standards had to be derived from a CMS.

The National Highway System Designation Act of 1995 changed the nature of the management systems from mandatory to voluntary with the exception of the congestion management system in TMAs. As the northeastern Illinois region is identified as an ozone non-attainment area, the CMS for northeastern Illinois remained mandatory. The CMS Plan for northeastern Illinois was approved by the Chicago Area Transportation Study (CATS) Policy Committee in October of 1997 and the Transportation Equity Act for the 21st Century (TEA-21) maintained the CMS requirement through Federal Fiscal Year 2005.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was signed by the President in August of 2005 and begins to redefine the law with a new title: the Congestion Management Process. The following language is included in (k) Transportation Management Areas under section 6001, Transportation Planning:

> *Within a metropolitan planning area serving a transportation management area, the transportation planning process under this section shall address congestion management through a process that provides for effective management and operation, based on a cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities eligible for funding under this title and chapter 53 of title 49 through the use of travel demand reduction and operational management strategies.*

It is believed that the congestion monitoring and congestion system requirements associated with air quality non-attainment areas will be maintained. FHWA and FTA guidance and rule making on the congestion management process is anticipated in early 2007.

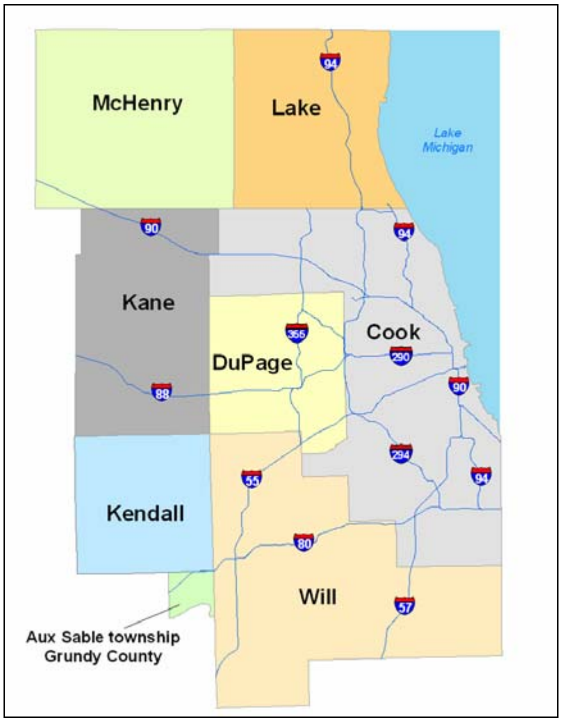
The CMS Status Report is produced periodically by CATS to summarize the operating characteristics of the region's transportation system. Its intent is to highlight key performance trends and identify areas of concern. This version of the status report uses archived traffic data to analyze roadway conditions. This is the third edition of the CMS Status Report, and was preceded by reports in 1999 and 2002. Other important CMS reports include the Congestion Mitigation Handbook, which identifies congestion mitigation strategies that should be considered as part of project development efforts, and the Army Trail Road Congestion Profile.

(This page left intentionally blank.)

2 Growth and Travel in the Region

The region covered by the CMS in northeastern Illinois corresponds to the metropolitan planning area for CATS, which is shown in Figure 2-1. This area includes seven full counties in northeastern Illinois (Cook, DuPage, Kane, Kendall, Lake, McHenry and Will) plus Aux Sable township in Grundy County.

Figure 2-1. CMS Area



This section of the Status Report provides some general information on the population and employment growth that have occurred in northeastern Illinois. It also discusses where people in the region are traveling to and what travel mode they use to get there. The following topics are examined:

- Population and employment changes occurring in the region over the last ten years, as measured by the U.S. Census;
- Changes related to people's commute to work, also measured by the Census; and
- People's preferences and opinions on transportation, taken from CATS' Transportation Opinion Survey.

2.1 Data from the 2000 U.S. Census

The decennial census is an important source of information in determining the demographic changes occurring in a region. The Census Transportation Planning Package (CTPP) is a special set of tabulations taken from the census to provide data for transportation planners. The CTPP data are taken from the "long form" questionnaire sent to one in six households. Census data can inform one about the number of people living in the region, how many of them work, where they reside, where they work, their mode of transportation, and how much time they spent on their journey to work[1].

The census examines one type of trip: the journey to work. It represents the usual amount of time that it took for a person to travel to work using his/her normal mode of transportation and the time that the person most often left for work during the week of the census. While this trip type only covers a portion of the traffic on the roadways, it is nevertheless informative to examine changes in work trip characteristics. The major findings from the census follow; these county-level summaries do not include Aux Sable Township in Grundy County.

[1] The Census only tracks one job and one journey to work trip for each worker. These numbers do not equal employment in the region because second or third jobs are not counted.

- **The population of the northeastern Illinois region increased 11.6% between 1990 and 2000 to over 8.1 million people.** Table 2-1 shows the county population for the region in 1990 and 2000, and the percentage increase. Cook County experienced the largest increase in new residents: over 270,000 additional people. This accounted for one-third of the total population increase for the region. DuPage, Lake and Will counties all experienced population increases of more than 120,000 residents. Table 2-1 also shows Cook County separated into the City of Chicago and the remainder of the county. Close to 60% of the population increase in Cook County occurred outside the City of Chicago.

Table 2-1. Population Change

	1990	2000	%
Cook County	5,105,067	5,376,741	5.3%
DuPage County	781,666	904,161	15.7%
Kane County	317,471	404,119	27.3%
Kendall County	39,413	54,544	38.4%
Lake County	516,418	644,356	24.8%
McHenry County	183,241	260,077	41.9%
Will County	357,313	502,266	40.6%
Region	7,300,589	8,146,264	11.6%
Suburban Cook	*2,321,341*	*2,480,777*	*6.9%*
Chicago	*2,783,726*	*2,895,964*	*4.0%*

- **The number of people working in the northeastern Illinois region increased 7.9% between 1990 and 2000 to 3.9 million.** There are two groups of workers contributing to this number: those who lived and worked in the region, and those who worked in the region but lived outside of it. These numbers are summarized in Table 2-2. The number of workers living and working in the region grew from 3.45 million to 3.69 million during the decade. During the same period, the number of workers coming into the region to work increased by over 46,000. A final group of workers is comprised of those who live in the region and work outside of it. This group increased from nearly 53,000 to around 64,000 during the decade.

Table 2-2. Workers in the Region

	1990	2000	Change
Live & work in region	3,454,257	3,690,441	236,184
Live out of region – work in region	128,553	175,170	46,617
Total working in region	3,582,810	3,865,611	282,801

- **While Cook County has the largest share of employment in the region, nearly 65% of the region's growth in employment occurred in DuPage and Lake Counties between 1990 and 2000.** Cook County contained most of the employment for the region in both 1990 (72%) and 2000 (66%), as shown in Table 2-3. However it was the only county to experience a decline in employment opportunities during the decade, as measured by the census. All of the other counties in the region experienced employment growth. The largest increases in employment during the decade occurred in DuPage and Lake

Table 2-3. Employment

	1990	2000	Change
Cook County	2,572,353	2,554,118	-18,235
DuPage County	433,250	534,551	101,301
Kane County	143,761	175,350	31,589
Kendall County	13,052	17,950	4,898
Lake County	245,165	326,167	81,002
McHenry County	64,998	96,642	31,644
Will County	110,231	160,833	50,602
Region	3,582,810	3,865,611	282,801

Counties. Only three counties (Cook, DuPage and Lake) had more employment opportunities than workers living in the county in 2000.

- **The average commute time to work increased by 3 minutes between 1990 and 2000.**

The journey time to work in northeastern Illinois increased from 28.5 minutes in 1990 to 31.6 minutes in 2000[2], taking into account all modes of transportation used. Table 2-4 displays the commute times for each county in the region and shows that commute times increased for residents of every county during the decade. The longest average work trip in 2000 (over 35 minutes) was experienced by residents of the City of Chicago, while residents of Kane County had the shortest commute (just over 27 minutes). The largest increase in commute times during the decade was experienced by Kendall County residents, whose average commute increased by more than 6.5 minutes.

Table 2-4. Commute Times

	1990	2000	Additional Minutes
Cook County	29.4	32.6	3.2
Chicago	*31.5*	*35.2*	*3.7*
Suburban Cook	*27.3*	*30.0*	*2.7*
DuPage County	27.3	29.0	1.7
Kane County	23.5	27.3	3.8
Kendall County	23.2	29.9	6.7
Lake County	26.4	30.1	3.7
McHenry County	28.8	32.2	3.4
Will County	27.3	32.0	4.7
Region	28.5	31.6	3.1

Table 2-5 displays the average commute time to work for five different modes of travel used in the region. Residents driving to work alone had the lowest average commute time in both 1990 and 2000. Workers who carpooled experienced an average commute to work that was about 3 minutes longer than those who drove alone. The commutes of the longest duration belonged to travelers using rail. With an average commute lasting more than an hour, rail travel took close to one-third longer than other forms of transit and twice as long as travel in autos.

Table 2-5. Commute Times by Mode of Travel

	Drove Alone	Carpool	Rail	Subway/ El	Bus
1990	25.7	29.1	58.4	43.7	41.1
2000	29.1	32.0	62.5	44.3	45.9

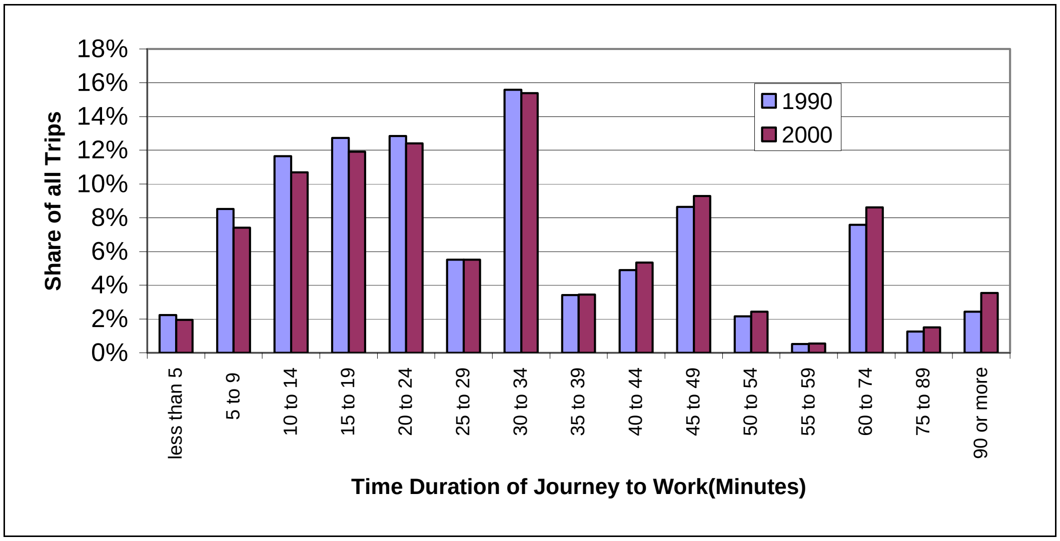
Figure 2-2 illustrates the longer commute times experienced in 2000. The graph shows the percentage of total work trips for 1990 and 2000 divided into fifteen trip duration categories[3]. Trips that took less than 35 minutes made up a relatively larger share of the

[2] Prior to Census 2000, the questionnaire permitted respondents to mark no more than two digits for their travel time, limiting reported travel time to 99 minutes. Three digits were made available in the Census 2000 questionnaire, reflecting the greater frequency of extremely long commutes. As a result, it is estimated that about 1 minute of the 3.1 minute increase for the Nation between 1990 and 2000 was due to this change in methodology (Source: U.S. Census Bureau. Journey to Work: 2000. *Census 2000 Brief*. U.S. Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau. March 2004.)

[3] Respondents' trip times were aggregated into the 15 categories by the Census Bureau.

total in 1990 than in 2000. In fact, in each of these seven duration categories, 2000 trips had a smaller share than 1990 trips. In all of the remaining categories, representing trips 35 minutes in length or longer, the 2000 trips represented a higher proportion than in 1990. There were more work trips in 2000 than in 1990, but the increase in trips was disproportionately larger for trips longer than 35 minutes in duration.

Figure 2-2. Time Duration of Journey to Work



- **Driving alone was the most-used travel mode by commuters, and a larger percentage of commuters used this mode in 2000 than in 1990.** Nearly seven out of ten commuters used this mode to get to work, as shown in Table 2-6. The drive alone mode was slightly more popular in 2000 than in 1990. Carpools moved just over 11% of the workers in 2000, down slightly from 1990. Transit modes accounted for 14.4% of the work trips in 1990 but declined to 12.3% of the trips in 2000.

  In total, 6.5% of the work trips were accomplished without reliance on motorized vehicles in both 1990 and 2000. Within these non-motorized trips, a majority were made by people walking to work. Most of the rest of the non-motorized work trips were attributed to people working at home, which became a larger share of the work trips during the decade.

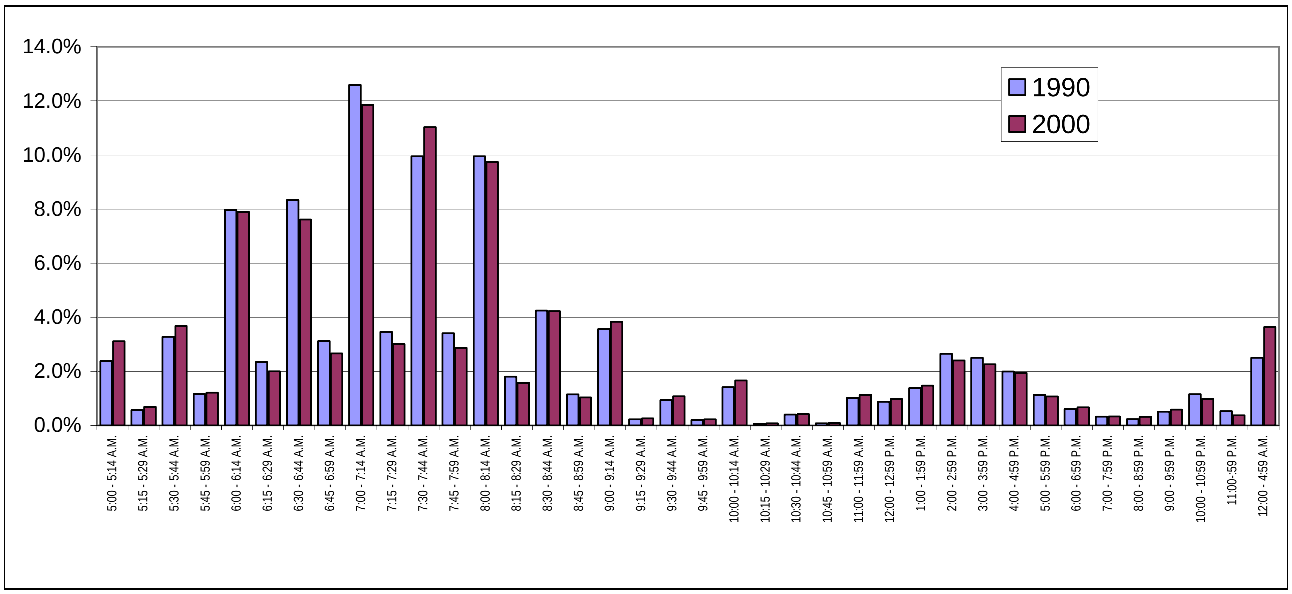
Table 2-6. Commuter Mode Splits

	1990	2000
Drove Alone	66.24%	69.09%
Carpool	11.95%	11.05%
Bus/Trolley/Streetcar	7.35%	5.10%
Subway/Elevated	3.35%	3.66%
Railroad	3.70%	3.56%
Bicycle	0.22%	0.32%
Walked	4.13%	3.20%
Taxicab	0.29%	0.33%
Motorcycle	0.05%	0.03%
Worked at Home	2.13%	2.95%

- **A greater share of commuters in the region started their work trip before 6:00 AM in 2000 than in 1990.** This is commonly referred to as "peak spreading" by transportation professionals, where people leave earlier to avoid the traffic congestion. Figure 2-3 displays the proportion of home-to-work trips in 1990 and 2000 that began during each census-defined time period. Fifteen-minute time periods were used by the census between 5:00 AM and 11:00 AM. Between 11:00 AM and midnight time periods were one hour in length. The time between midnight and 5:00 AM was combined into one time period.

A larger share of the work trips began before 6:00 AM in 2000 than was the case in 1990. The proportion of work trips starting between midnight and 5:00 AM was 46% higher in 2000 than in 1990. It is not possible to determine if all of these trips were workers leaving early to beat the morning "rush", but there was a large increase in this pre-rush hour period. The opposite was true after this time period. In 1990, there was a higher share of workers that left for work between 6:00 AM and 7:30 AM than was the case in 2000.

Figure 2-3. Commute Trip Start Time



Comparing 2000 to 1990, there was no clear pattern for trips beginning in the time period extending from 7:30 AM and 11:00 AM. However, there was a higher share of work trips in 2000 that began in each time period between 9:00 AM and 2:00 PM. Conversely, a higher share of work trips began between 2:00 PM and 6:00 PM in 1990 than in 2000.

2.1.1 Implications of Census Data

In order to provide efficient transportation in the Chicago region it is important to forecast future trips accurately. The forecasts allow planners to understand where potential traffic flow issues may exist. Information from the census can be used to track the changing demographics and their possible impact on regional travel.

Over the previous decades the vehicle miles of travel (VMT) in the Chicago region has continued to increase. In addition to this increase in VMT, the share of the population that is involved in the workforce had also continued to increase. But this has changed. The 2000 census was the first time since the advent of the expressway system that there was a decline in the percentage of the population that were in the workforce[4]. If this trend continues into the future, then fewer work trips would need to be modeled, while additional leisure trips, which could be accomplished in non-peak hours, would be modeled. The new mix of work and non-work trips can have a significant effect on how the region decides to invest in the transportation network.

According to the 1990 census, 48% of the population was engaged in the workforce. The workforce participation rate for 2000 was 46%. There are some possible explanations for this decline. One of the most significant trends in the region between 1990 and 2000 was the increase in the Hispanic population. The population of the Chicago region increased by 11.6% (845,675 people) during the decade. Of this increase, 67.4% is due to an increase in the number of people who designated themselves as Hispanic for the 2000 census[5]. This is significant with regards to the work force participation rate because within the region only 36% of the Hispanic population is engaged in the workforce. The non-Hispanic population has a workforce participation rate of 48%. The region's share of the population that is in the workforce is lower as a result of the shift in demographics between 1990 and 2000. Interestingly, fewer workers commuting to work in 2000 than would be expected under the higher workforce participation rate seen in 1990 may have lessened delays on parts of the transportation network.

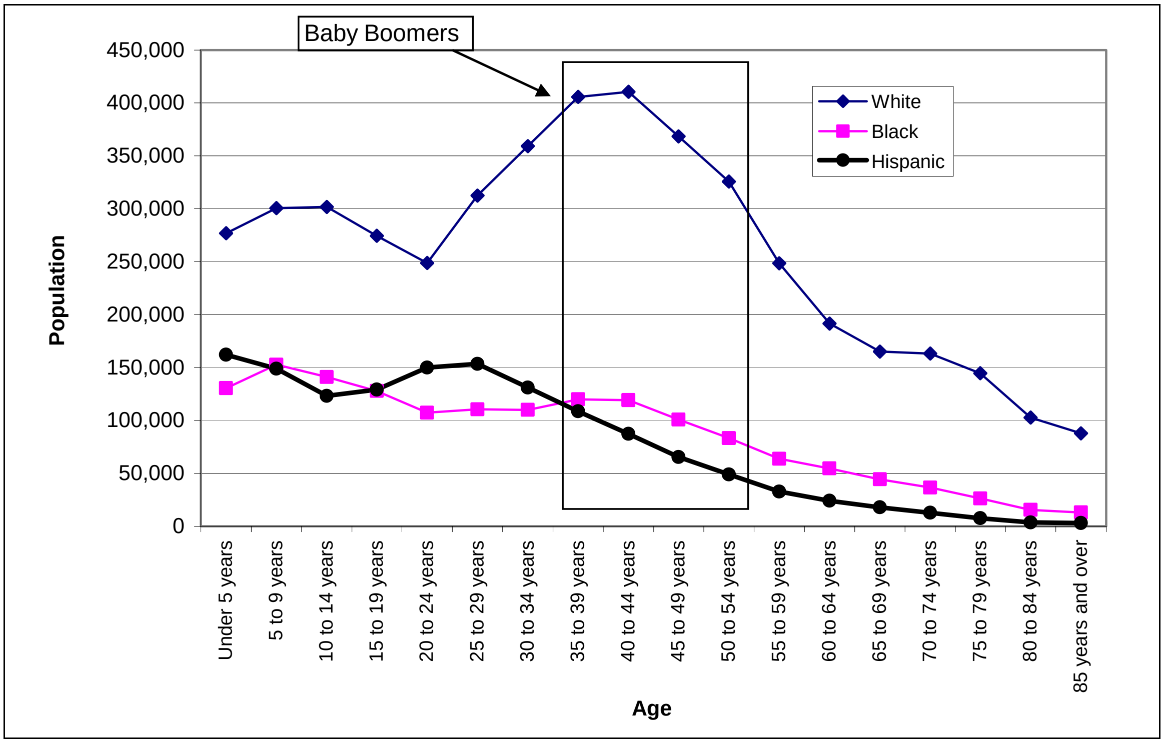
The issue for the future is the degree to which the new Hispanic population will emulate the travel patterns of the established populations. Figure 2-4 shows the number of white, black and Hispanic individuals in different age groups in 2000. The Hispanic population in the region is younger than the rest of the population and more likely to have been born in a different country than the rest of the population. If the Hispanic population begins to have similar travel patterns to the rest of the region, there will be additional stress on the transportation network. Additional investigations into this issue will be needed to better understand the travel patterns.

An additional factor in forecasting the future workforce involves the "Baby Boomer" generation, indicated by the box in Figure 2-4. As can be seen in the chart, this large group of residents is just beginning to withdraw from the workforce in significant numbers. Economic conditions and the decision of where to spend their retirement years will have a major impact on the share of the population that is engaged in the workforce. These issues will become more dominant in the next decade when the largest populations reach the traditional retirement age. These developments will also have to be monitored in order for the region to make the best transportation investments.

[4] Sööt, Siim, Joseph DiJohn and Ed Christopher. Chicago Area Commuting Patterns: Emerging Trends. University of Illinois at Chicago, Urban Transportation Center, Chicago, IL. March 28, 2003.

[5] The census in 2000 altered the order of the questions concerning Hispanic and race on the forms. The 2000 form was also the first to allow a person to designate more than one race. These changes are felt to have had a minimal effect on accuracy of the Hispanic description (Source: U.S. Census Bureau. We the People: Hispanics in the United States. U.S. Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau. December 2004.)

Figure 2-4. Population Groups by Age, 2000



2.2 CATS Transportation Opinion Survey Results

During 2004 and 2005 CATS hosted a series of nearly two-dozen "Partners in Progress" outreach initiative meetings that were held throughout the region. The intent of these meetings was to increase public awareness of transportation planning, encourage community involvement and solicit public input on the transportation planning process from residents, elected officials and other stakeholders. Meetings were held at locations around the region including Dixmoor, Country Club Hills, Aurora, Geneva, Elmhurst, Winfield, Crystal Lake, Fox Lake, Vernon Hills and various neighborhoods in the City of Chicago All meeting participants were asked to fill out the CATS Transportation Opinion Survey[6] to identify their concerns with the region's transportation system.

The number of survey responses received to date total 699. While these responses have not been modeled or weighted to reflect the population of the entire northeastern Illinois region, they do describe the general views of a limited population. Given these limitations, the responses do contain some general trends.

Summary of Survey Responses

Survey participants were asked to identify the modes of transportation they typically use and were presented with a list from which they could choose problems they had observed or experienced in their daily travel. Multiple selections were allowed. Travel problems were presented in two groups: those related to general traffic and those that are specific to transit. The

[6] The survey questionnaire is available at the CATS website (www.catsmpo.com/prog/pi/trans_opinion_survey.doc).

two most frequently cited general traffic problems were "Traffic Congestion" (selected by 85% of all respondents) and "Roads in Bad Condition" (selected by 59% of all respondents). The two most cited transit related problems were "It Doesn't Serve the Area Where I Live" and "It Doesn't Serve the Places I Need to Travel to", both of which were selected by 32% of all respondents.

The survey response rates are summarized in Table 2-7. Respondents were first categorized as being auto users or non-auto users. The non-auto users were then separated into two groups: those who only walked or used a bicycle (8 individuals) and those who used transit in addition to walking and cycling (31 individuals). The auto users were also divided into two categories: those who used automobiles (and may also have used a bike or walked) but did not use transit (425 people) and those who use autos and transit in addition to possibly walking or cycling (235 people).

Table 2-7. CATS Survey Response Rates

	No Auto Use		Auto Users	
Traffic Related Problems	Bike Ped Only (8)	Transit-No Auto (31)	Auto-No Transit (425)	Auto and Transit (235)
Traffic Congestion	50%	48%	87%	88%
Roads Are In bad Condition	25%	35%	59%	63%
Intersection Delays	0%	29%	51%	52%
Railroad Crossing Delays	38%	6%	39%	50%
Inadequate Signage	13%	16%	15%	23%
Transit Related Problems				
It Doesn't Serve The Area Where I Live	38%	10%	32%	33%
It Doesn't Serve The Places I Need To Travel To	50%	19%	33%	30%
It Is Too Slow	38%	48%	16%	16%
It is Too Expensive	25%	16%	6%	11%
Service Is Infrequent	25%	48%	19%	30%
I Don' t Feel Safe	0%	13%	7%	10%
I Don't Have Information About Available Service	25%	6%	16%	17%

The survey results in Table 2-7 are summarized below:

General Traffic Problems

- **Traffic Congestion:** This was the issue cited the most often for all respondents. About one-half of the people who did not use autos felt that traffic congestion was an issue. Auto users noted that traffic congestion was an issue in 87% of the responses.
- **Roads Are In Bad Condition:** The conditions of the roads were an issue for one-third of the people who did not use autos. The user of autos had a higher response rate to this question: 61% of these respondents noted this as being a problem.
- **Intersection Delays:** Intersections delays were not noted by any of the people who traveled exclusively by bike or on foot. Individuals who used transit, but not autos, noted intersection delay in 35% of the responses. People who used autos noted that intersection delay was an issue for them in 51% of the responses.
- **Railroad Crossing Delays:** In total, 13% of people who do not use autos felt that delays at railroad crossings were an issue. Within this group, the issue was more significant for

individuals who only used bicycles or walked. Delays at railroad crossings were noted in 43% of the responses for individuals who used autos. Within this group, auto users who also used transit noted the delay more frequently than those who did not use transit.

- **Inadequate Signage:** Inadequate signage was cited least often as being a problem.

Transit Problems

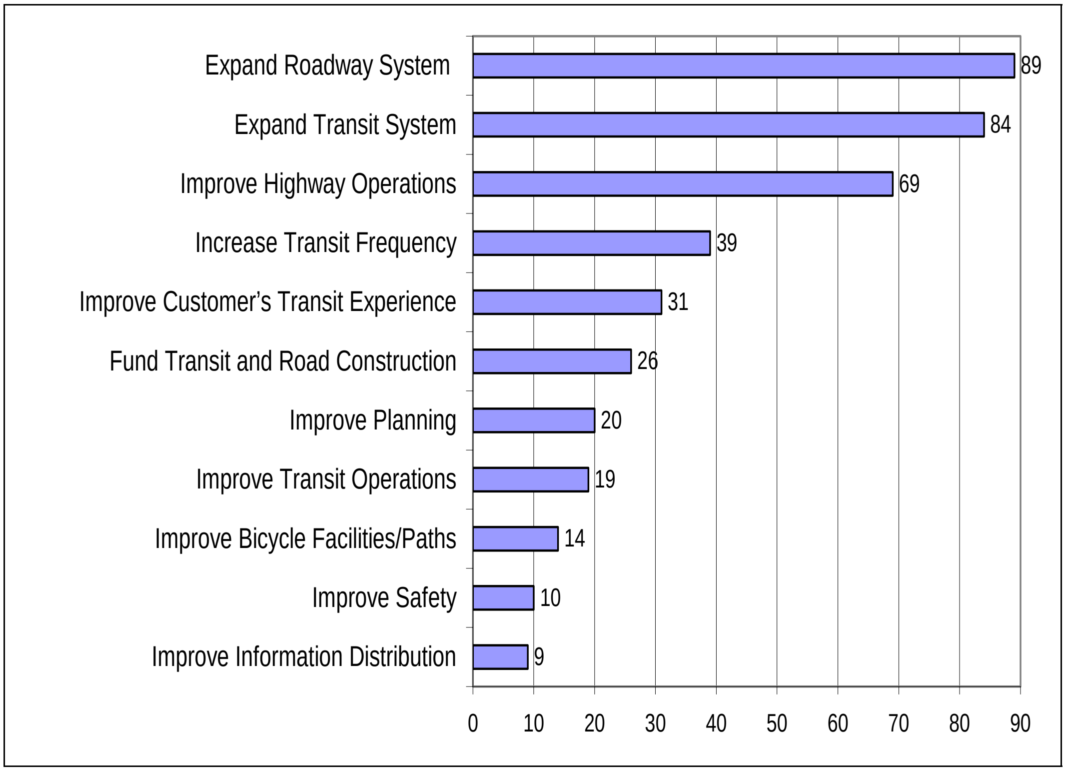
- **It Doesn't Serve The Area Where I Live or the Places that I Need To Travel To:** Two of the questions dealt with the issue of transit being able to service a particular trip. It was noted that transit "doesn't serve the area where I live" by 38% of the individuals who traveled only by foot or bicycle. People who use autos had a positive response to this statement on one-third of the questionnaires. Individuals who used transit but not autos only responded to this statement 10% of the time. A similar statement that transit "doesn't serve the area that I need to travel to" had similar response rates. One-half of the people who only walk or bike noted this issue. About one-third of people who use autos felt that this was an issue. Nineteen percent of individuals who use transit but not autos noted that the area where they travel to was not served.
- **It Is Too Slow:** Transit was noted as being too slow in almost one-half of the responses by individuals who only use transit. This rate was three times higher than for people who use autos, or autos and transit. Individuals who only walked or used a bike noted that transit was too slow in 38% of the responses.
- **It is Too Expensive:** Individuals who used autos but not transit only noted that transit was too expensive in 6% of the responses. People who only walked or used bikes noted that transit was too expensive in 25% of the responses. Users of transit, but not autos, noted that transit was too expensive in 16% of the responses. Eleven percent of individuals who used both transit and autos agreed that transit was too expensive.
- **Service Is Infrequent:** About one-half of the users of transit but not autos felt the service was too infrequent. Thirty percent of the individuals who used both autos and transit noted that transit service was too infrequent. The two groups who do not use transit both had lower response rates to this issue.
- **I Don't Feel Safe:** Issues concerning safety where noted on the fewest surveys. The highest response rate of 13% was from users of transit but not autos.
- **I Don't Have Information About Available Service:** Only six percent of those who traveled using transit but not autos agreed with this statement. Both groups of auto users had similar response rates: 16 and 17%. One-quarter of the respondents who only walked or used bikes noted that they didn't have enough transit information.

Summary of Comments Received

Survey participants were invited to provide comments on ways "to improve the transportation system in northeastern Illinois." The comments received covered a wide range of issues and offered many suggestions. In order to summarize these comments, the responses were grouped into eleven general categories which are shown in Figure 2-5, along with the number of respondents who addressed the issue[7].

[7] All comments received are published in other CATS documents (available at www.catsmpo.com/reports.htm).

Figure 2-5. Summary of Survey Comments



A summary of the comments received for each category follows:

- **Expand Roadway System** (89 responses): Expand the roadway system through the additions of expressways, roads, additional lanes, new interchanges or new bridges across waterways.
- **Expand Transit System** (84 responses): Increase the extensiveness of the transit system by adding new train lines and stations and adding new bus routes. These services should be added to where people live and also to their destinations. Increase service in the south. Increase shuttle service and build north-south corridors.
- **Improve Highway Operations** (69 responses): Improve the roadway system through various strategies: optimize traffic signals, add carpool lanes, construct underpasses at highway rail crossings, improve the cleanup of incidents, remove toll booths, increase the use of I-Pass, use a turn pike system instead of toll plazas, use more double left turn lanes, repair or rebuild roads less often, do not work on parallel corridors at the same time, only close lanes on areas where there is actual work being done on that day, move the rail freight operations to the late-night or early morning hours, move trucks to a route that circumvents the region, increase carpooling, complete more road construction at night, give cash incentives to get workers off roads, increase speed limits, and improve training for drivers.
- **Increase Transit Frequency** (39 responses): Increase the frequency of transit system. Add more trains and buses and extend the hours of operation. Extend Metra service throughout the night on weekends.
- **Improve Customer's Transit Experience** (31 responses): Improve transit facilities, make them cleaner, install restrooms in stations and on trains, make sure that all restrooms are

clean, make stations more handicap accessible, increase the number of parking spaces at train stations. Encourage transit workers to be more polite, buses should always be at the curb when stopping for passengers, improve service for handicapped persons and adhere to the schedule for picking up or dropping off handicapped passengers, add more security to make passengers feel more secure. Allow everyone equal access to services

- **Fund Transit and Road Construction** (26 responses): Increase funding to transit and to the construction of roads and fund the CREATE project. Increase transit funding to lower the cost to transit riders, increase some county taxes to pay for new road construction, ensure equitable distribution of transportation funds. Fund the South Suburban Airport
- **Improve Planning** (20 responses): Improve the coordination of construction projects, build roads before there are traffic problems (use the future traffic forecasts), build the roads more quickly. Include more community representation in planning. Build roads before development is allowed.
- **Improve Transit Operations** (19 responses): Build high-speed rail, keep loading commuter trains from blocking crossings, prevent back-to-back or double freight trains, prevent buses from bunching up, increase the connections between transit systems, and add bus-only lanes.
- **Improve Bicycle Facilities/Paths** (14 responses): Add bicycle paths, allow bicycles on more trains, increase the number of streets with bicycle lanes, improve safety for bicyclists, and increase bicycle paths in commercial areas
- **Improve Safety** (10 responses): Reduce the number of speeders, ensure that trucks obey laws, install additional pedestrian safety controls, and enhance bicycle safety.
- **Improve Information Distribution** (9 responses): Improve transit user education so that they are aware of the options, provide more information in papers concerning the effects of construction on travel times, and provide information concerning how long construction projects will take.

The survey participants also provided 49 responses that complimented the transit system and 15 that complimented the roadway system and the I-Pass program. As part of the update to the 2030 Regional Transportation Plan, CATS is conducting an online survey for the public to provide comments on regional transportation policies and issues[8]. The survey responses will help inform the debate on transportation issues.

[8] The survey is currently available at http://freeonlinesurveys.com/rendersurvey.asp?sid=zzkwxbf42p4uvjz187842.

(This page left intentionally blank.)

3 Current Roadway Conditions

This section of the Status Report examines the current operating conditions of the region's roadways. Past CMS analyses have been hampered by a lack of timely data on travel conditions and the absence of a robust dataset describing current roadway conditions. This Status Report update relies on archived 5-minute summary data from roadway detectors located on the expressway and tollway system in northeastern Illinois to analyze the current conditions. This information is being made available to public transportation agencies through the Intelligent Transportation Infrastructure Program (ITIP)[9].

This section of the report discusses the following issues:

- A description of the archived data sets used to analyze roadway traffic conditions.
- A look at expressway traffic conditions based on an analysis of the archived data.
- A look at traffic patterns for the arterial system based on data collected for the Highway Performance Monitoring System.

3.1 Archived Traffic Data

In northeastern Illinois both the Illinois Department of Transportation (IDOT) and the Illinois State Toll Highway Authority (ISTHA) are partners in ITIP. IDOT provides Intelligent Transportation System (ITS) data for the expressways through its system of inductance loop detectors imbedded in the roadway pavement. Raw detector data are processed by IDOT's Traffic Systems Center and aggregated into 5-minute summaries. The summarized data are then archived by Mobility Technologies. Data for the tollways are being provided through microwave sensors Mobility Technologies has placed on poles along the roads. Travel time data collected by ISTHA through the I-Pass automatic toll collection system is not currently being made available through ITIP. These data archiving activities are the start of a larger effort to create a regional archive of transportation information that can be used for operations, operations planning and regional transportation planning.

Data on current traffic conditions are available to the general public at www.gcmtravel.com. This site is operated by the Gary-Chicago-Milwaukee (GCM) ITS Priority Corridor partners and utilizes the same data used for the analyses in this report. Interested individuals can perform their own analyses on the archived data using tools built into the website. *Refer to the first item under Section 6 of this report for additional information.*

The analyses presented in this report were developed using data summarized for each detector every 5 minutes, for a total of 288 summary periods per day. The data used were recorded for the time period July 2004 through June 2005. The pieces of information available for each detector during each summary period include the traffic count, the average speed and the

[9] The ITIP was authorized by TEA-21 and is a partnership between FHWA, participating state and local transportation agencies and a private company (Mobility Technologies). Its intent is to use ITS data to enhance regional traffic surveillance, and to improve the quality of information available for measuring system performance and for traveler information.

detector occupancy rate, or the percentage of the 5-minute period that the detector was occupied by vehicles. Also included is the number of valid readings taken during each 5-minute period.

In general the data recorded by the detectors reflect real-world conditions: travel speed decreases resulting from stalled vehicles, minor construction, etc. will be reflected in the data. Major roadway construction projects may cause detectors to be non-operational. Likewise automatic data quality checks performed by Mobility Technologies and IDOT's Traffic Systems Center may prevent detector data from being archived during a major collision if the recorded data elements cross certain preset thresholds.

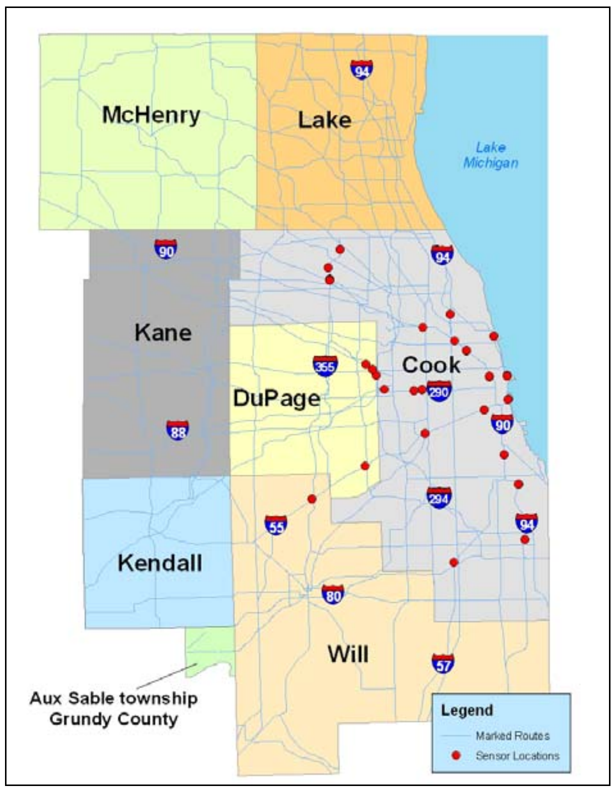
3.2 Expressways

Past CMS analyses have relied on the increase in VMT or on modeled traffic data to describe roadway usage. Generally these measures have been summarized at the county or sub-county level. While these metrics provide a useful way to compare the relative degree of congestion among summary areas or to examine the change in the amount of congestion in an area over time, regional congestion statistics cannot be easily applied to a specific trip. While such a macro-level discussion examines what is occurring in the region, it is not that useful to individuals interested in a trip made through a specific corridor. This edition of the Status Report analyzes expressway operation at the corridor level to provide a different perspective on roadway congestion.

3.2.1 Traffic Variation of the Expressway System

Traffic volumes vary by hour, by day and by month. The general trends for the expressway system in northeastern Illinois were estimated by aggregating hourly data from 26 locations with sensor stations that had relatively complete records in both directions of travel for the entire year from September 2004 through August 2005. These locations are shown in Figure 3-1.

Figure 3-1. Traffic Analysis Detector Locations

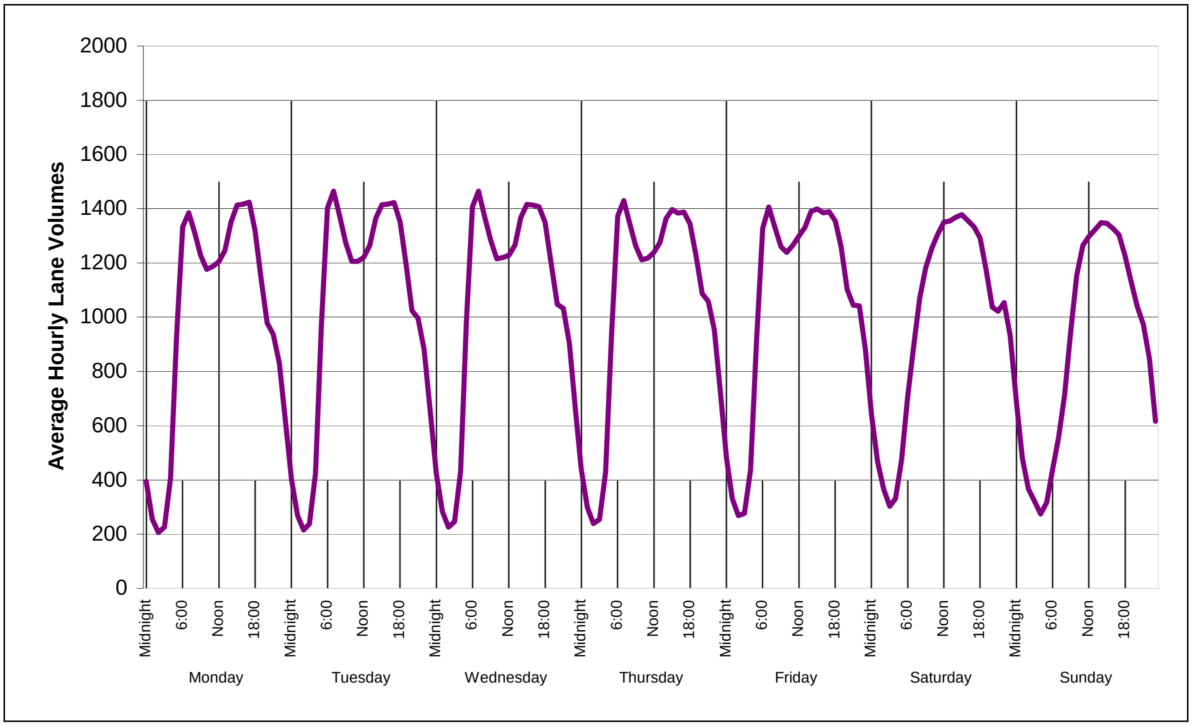


Hourly Traffic Variation Across the Week

Figure 3-2 shows the variation in average expressway traffic volumes over the 168 hours in a week. The pattern for the expressways is fairly consistent Monday through Thursday. Morning and evening peaks are evident, with the evening peak spread out over a longer period. On Tuesday, Wednesday and Thursday the highest hourly volume in the morning peak period is slightly greater than the highest traffic volumes recorded in the PM peak.

The minimum traffic flow between the morning and evening peaks occurs at 10:00 AM. The traffic flow at this time is about 14% lower than during the peak hour.

Figure 3-2. Hourly Expressway Lane Volumes

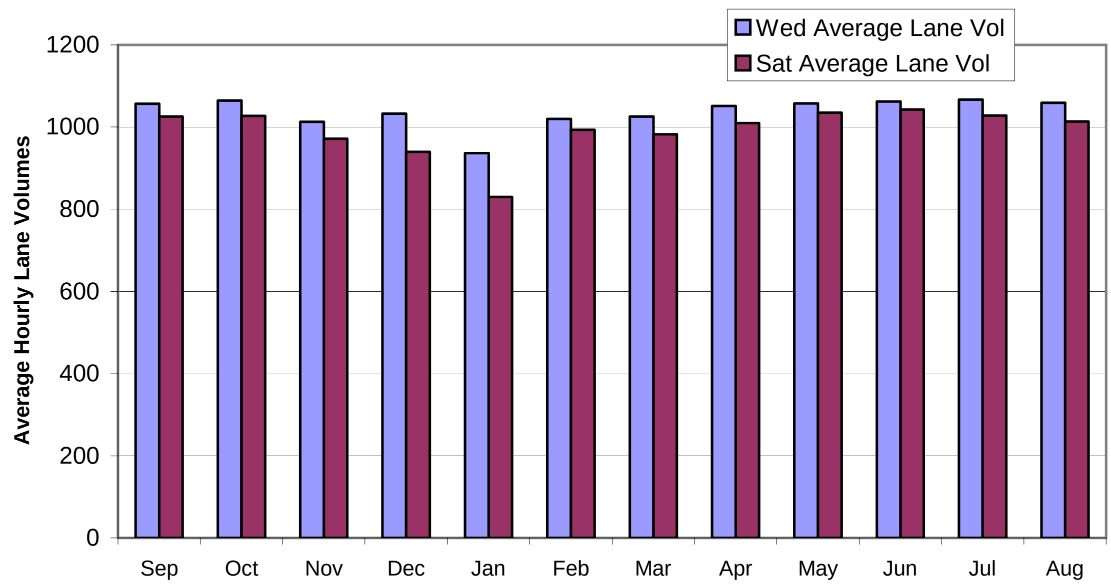


On Saturdays and Sundays there are no morning and evening peak travel periods on the expressway system. Rather, there is a single peak traffic volume profile that reaches its maximum between 2:00 PM and 4:00 PM. The peak travel period begins earlier on Saturday than on Sunday and also ends later. During the peak hours on Saturday and Sunday the average traffic volumes on the expressways are slightly greater than during the same times on the weekdays.

The lowest volumes on the expressway system occurred in the hour spanning 2:00 AM to 3:00 AM Monday through Friday. On Saturday and Sunday the lowest volumes are recorded an hour later: between 3:00 AM and 4:00 AM. The lowest hourly volumes are about one-seventh of the highest average hourly volume for each day.

The traffic volumes on the expressway system vary from month to month for both weekdays and the weekend. In this analysis, weekday traffic is represented by Wednesday data and the weekends are represented by Saturday data. These variations are shown in Figure 3-3. The average hourly volumes were always lower on Saturdays than on Wednesdays. For both days, the lowest expressway volumes occurred in January. The next lowest Saturday volumes occurred during the two months before and the two months after January. The traffic volumes on Saturdays were the greatest during May and June although these volumes were similar to the other mild-weather months.

Figure 3-3. Monthly Variation for Wednesdays and Saturdays

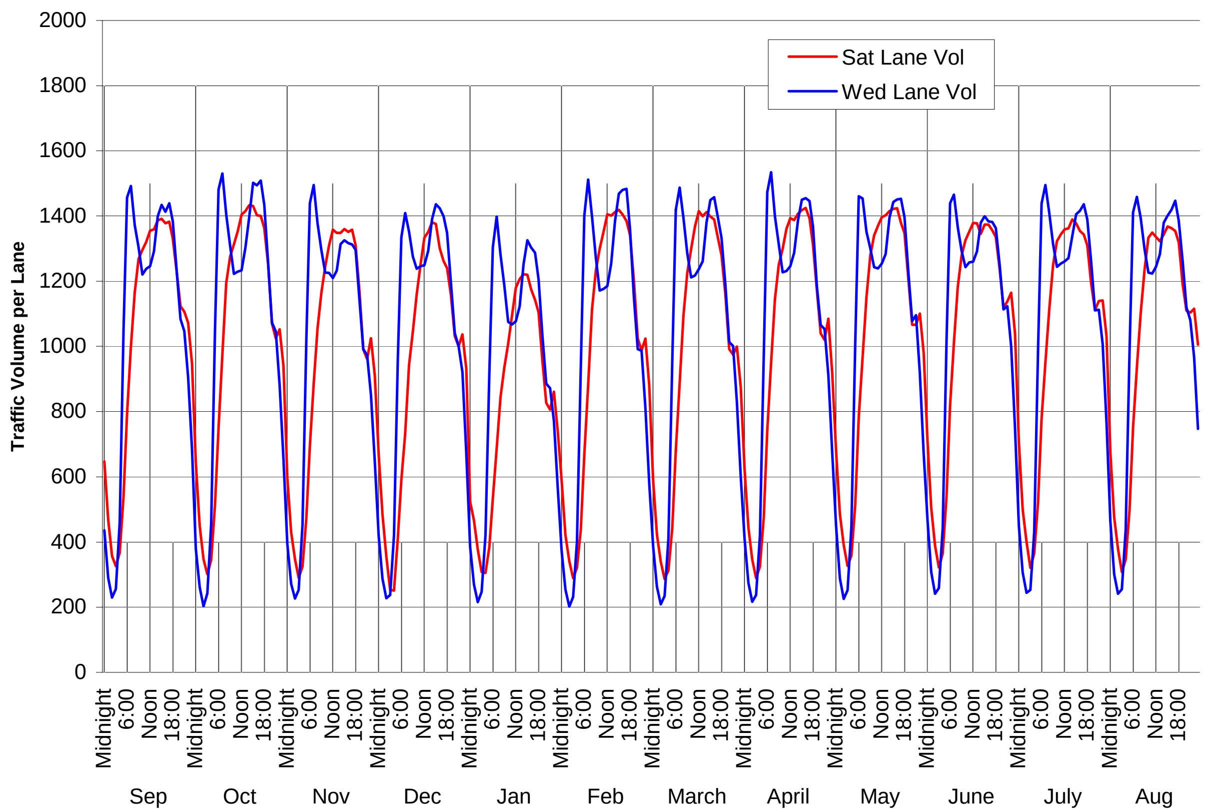


Hourly Variation by Month

The monthly comparison of weekend and weekday traffic volumes is further broken down by the hourly variation of Saturdays and Wednesdays throughout the year (shown in Figure 3-4). Analysis of the traffic data at this level leads to some surprising results. The afternoon peak traffic flow for Saturdays is actually greater in the low volume months of February and March than in the peak volumes in June, July, August and September. These latter months carry more traffic and have peak travel periods that last longer than the peak in February or March, but in the highest volume hour carry less traffic than these two months.

The peak period volumes for Wednesdays are also more similar to each other than are the off-peak travel. At the busiest hour on the expressway system there are similar traffic volumes. The warm months of May through September had very similar peak to peak traffic patterns.

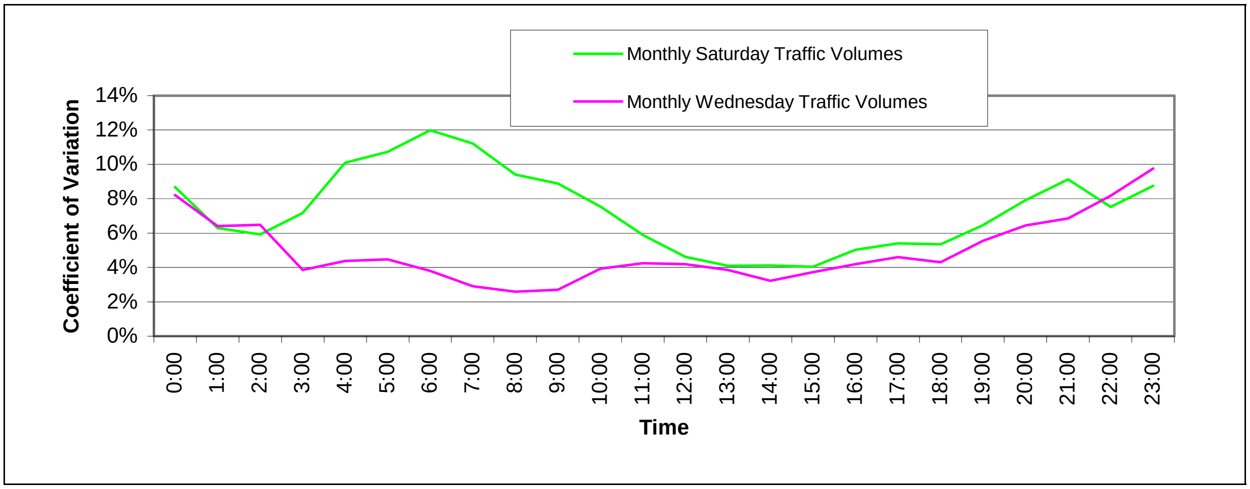
Figure 3-4. Weekday and Weekend Hourly Lane Volumes



The average hourly traffic volumes varied less for Wednesdays than for Saturdays. The standard deviation for Saturdays was 59 or 6.0% of the average value. On Wednesdays the standard deviation was 37, or only 3.6% of the average volume. Although the variation was slight, the relatively colder months of November, December, January, February and March had the lowest Wednesday hourly lane volumes.

The hourly traffic volume for each hour between months varies, but it is difficult to determine how much variation is occurring if one simply examines the previous figure. For Saturday and Wednesday, the standard deviation was calculated for monthly volumes for each hour of the day. The standard deviation as a percentage of the average (coefficient of variation) is graphed in Figure 3-5. Considering both days, the off peak hours have a larger relative variation than the peak traffic hours. The off-peak hours can be highly affected by non-recurring events. Alternatively, it may be that there is peak-spreading occurring on high traffic volume days and this traffic is shifting over to the non-peak hours in order to minimize travel times. Regardless of the cause, peak hour traffic varies less than traffic in the off-peak hours.

Figure 3-5. Variation in Hourly Traffic Volumes



Effect of Congestion on Traffic Volumes

Figure 3-6 shows the relationship between the Wednesday average traffic volumes (the same volumes as the previous figure) and the occupancy levels on the expressways. The occupancy rate is the percentage of time that a sensor can detect a vehicle over it. Given a volume of traffic, the higher occupancy rates result in lower speeds. At higher levels of occupancy the roads are considered congested.

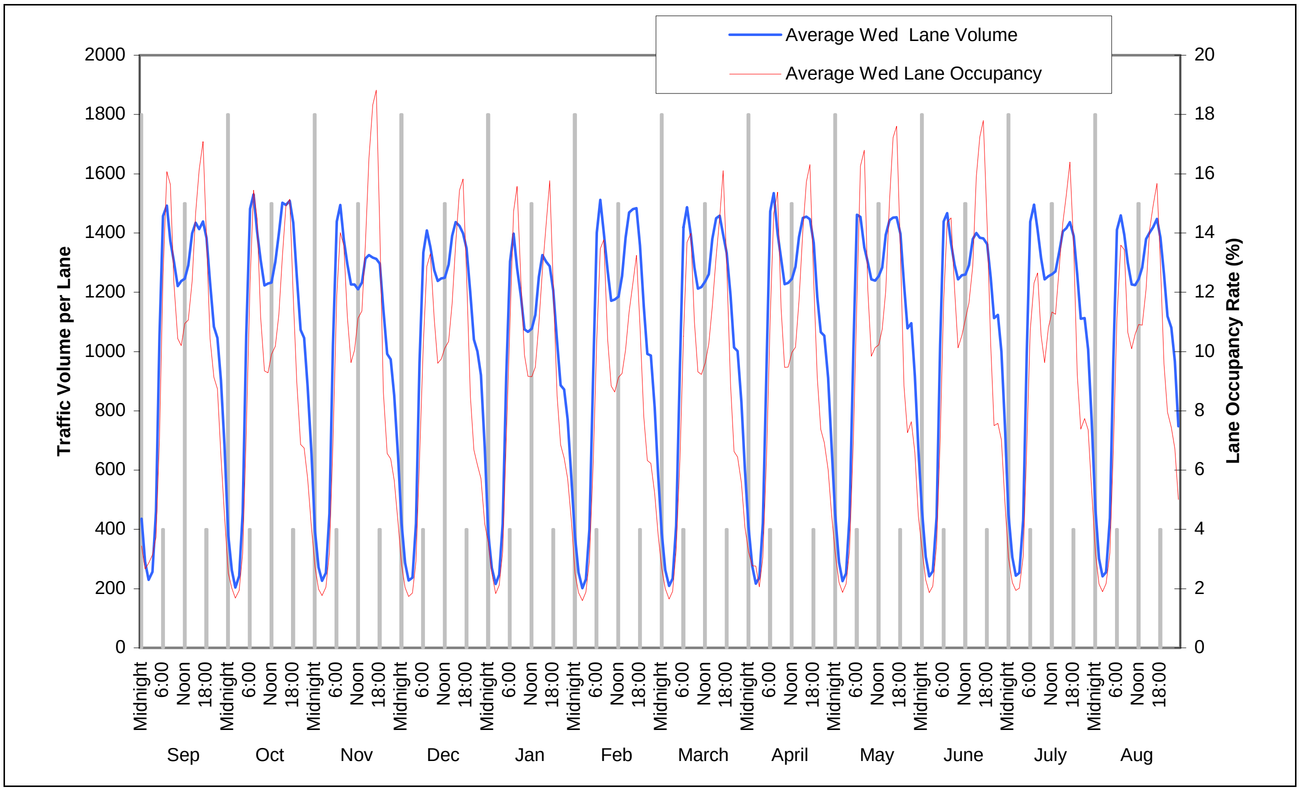
In the figure, the two highest occupancy rates occurred in November and June during the PM peak. The highest occupancy rate was in November and it coincided with the lowest peak volume for any month. Additionally, this month had fairly normal morning peak characteristics. The high occupancy rates and low traffic volumes resulted in lower speeds than in other months. The low speeds resulted in drivers taking non-expressway routes or not making the trip at all. Further analysis, which considered weather conditions, major construction or serious incidents, would allow the low traffic volumes to be better understood.

The second highest occupancy rates took place in June PM peak period. June had lower hourly PM peak volumes than either of the surrounding months, May and July. The higher occupancy rates in June, along with the lower traffic volumes, resulted in lower average speeds for this month. Throughout the PM peak the volumes were lower but the occupancy rates were higher in June compared with May or July.

The cold weather months of January and February showed an interesting trend. The traffic volumes were lower in January but the occupancy rates were much higher. The travel times in January were much longer in February. Checking the precipitation record revealed that January 2005 was slightly warmer than normal and it had over 29 inches of snow, making it the fourth highest January total since 1928. February had less than 4 inches. In light of the weather information, the slow travel and low traffic volumes seem reasonable.

It appears that long travel times discourage trips or lead to the use of alternate routes. With continued data collection over an expanded network it may be possible to determine where the re-routed trips went and how many trips were discouraged or made at other times.

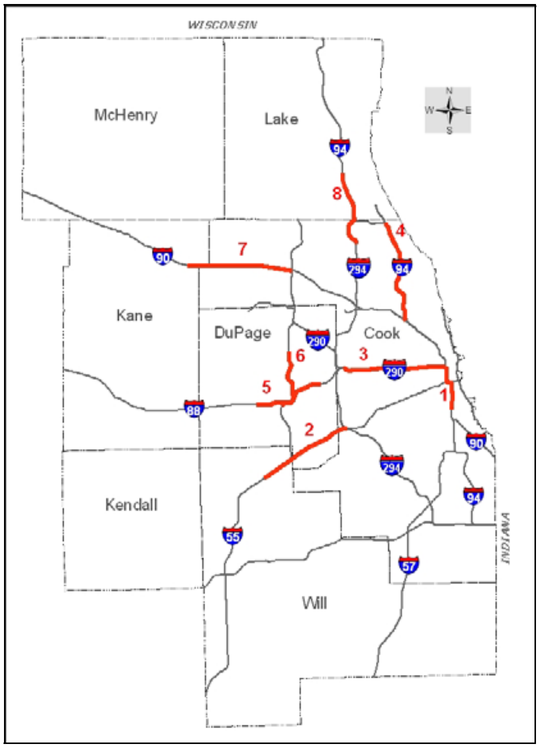
Figure 3-6. Wednesday Lane Volume Versus Occupancy



3.2.2 Expressway Corridors

While examining the traffic patterns is helpful in understanding expressway usage in general, it does not translate that easily into a discussion of congested conditions. For this analysis congestion will be discussed in terms of specific expressway corridors. Eight corridors were selected to represent expressway travel in the region. These corridors were chosen to characterize different geographic areas in the region, as well as different types of travel (central city-suburban vs. suburb-to-suburb). The selection of these corridors also accounted for the fact that some detectors were non-operational for extended periods as a result of construction activities. These corridors will serve to: (1) describe the current travel conditions and (2) serve as a baseline that future data can be compared against. Figure 3-7 lists the travel corridors analyzed and shows their locations in the region.

Figure 3-7. Expressway Corridors Analyzed



Corridors

1. Dan Ryan Express lanes – between 55th Street and Circle interchange
2. Stevenson Expressway – between I-294 and Naperville Road
3. Eisenhower Expressway – between Wolf Road and Circle Interchange
4. Edens Expressway – between Edens Spur and Junction
5. Reagan Tollway – between IL 83 and Naperville Road
6. North-South Tollway – between US 34 and IL 64
7. Northwest Tollway – between I-290 and IL 31
8. Tri-State Tollway – between IL 60 and Willow Road

The first four corridors listed are monitored with sensors owned and maintained by IDOT. The remaining corridors are on the Illinois tollway system and are monitored with Mobility Technologies sensors. The results presented in this section represent the average weekday travel conditions, which were determined by only including data from non-holiday Tuesdays, Wednesdays and Thursdays.

Travel time is the preferred method of disseminating traffic conditions to the general public. This is true not only for transportation agencies, but also for news media reporting traffic conditions. Travel time is an easily understood measurement and is the way people generally think about trips. Most travelers are concerned with how long a trip will take and how to minimize their travel time, rather than with how to maximize their travel speed.

Corridor travel times were developed using the 5-minute summary speeds for each sensor in the corridor. The average 5-minute speed for each sensor was applied to a roadway segment that spanned half the distance to the preceding and subsequent sensors in order to develop a travel time associated with that sensor. The travel times for all segments in the corridor were summed to develop an overall corridor travel time for each 5-minute period of the day. Finally, average travel time was calculated for each 5-minute period over all of the days of data to develop a profile of the average day of travel.

Travel reliability is also an important aspect of travel. In a 2001 customer satisfaction survey, the FHWA found that system reliability, rather than congestion itself, was a large factor in the public's frustration and dissatisfaction with the roadway system[10]. As such, a system reliability measure is also included for each corridor.

The following pages describe the conditions for both travel directions of all eight corridors using these measurements:

- Average travel time – the average time it takes to travel the specified corridor on a normal weekday, shown for the entire 24-hour period. This is the amount of time drivers can reasonably expect to spend traveling through the corridor.
- Percent variation – this measure looks at the average reliability of traffic flow, or how stable the travel times are. It is calculated by dividing the standard deviation of travel times (a statistical measure of how spread out the times are) by the average travel time. The resulting percentage describes how large the standard deviation is compared to the average travel time. The higher the percent variation, the more unreliable the traffic flow (hence the more fluctuation there is in travel times). Percent variation is currently being used as a performance measure by the California Department of Transportation[11].
- 95th percentile travel time – this line indicates that 95% of the travel time observations for a given 5-minute period fall below this line. Put another way, it represents the amount of time that one should allow for a trip in order to be on-time 95% of the time. The Washington State Department of Transportation uses this measure, termed the 95% Reliable Travel Time[12]. Researchers at the Texas Transportation Institute at Texas A&M University use a form of the 95th percentile travel information to develop a Planning Time Index, which indicates the additional percentage of travel time above the average travel time necessary to be on-time for 95% of trips[13].

It should be noted that while one average travel time per each 5-minute period is reported for these corridors, that does not mean travel speeds were uniform throughout the corridor during that period. The corridor average travel time may mask a range of travel speeds experienced at locations within the corridor. Also, one must be cautious in directly comparing data between the IDOT and Mobility Technologies sensors, as they are different systems using different types of instruments to collect the data.

---

[10] Federal Highway Administration, Congestion Vital Few Goal Team. "FHWA Performance Measurement Efforts on Congestion." July 10, 2002. Available at www.fhwa.dot.gov/congestion/cgst_vfg.htm.

[11] Booz-Allen & Hamilton, Inc. Transportation System Performance Measures: Status and Prototype Report. California Department of Transportation, Transportation System Information Program, Sacramento, CA, October 2000.

[12] Washington State Department of Transportation. Measures, Markers and Mileposts [commonly referred to as the "Gray Notebook"], 19th edition. November 18, 2005. Available at www.wsdot.wa.gov/accountability.

[13] See, for example: Lomax, Tim, Shawn Turner and Richard Margiotta. Monitoring Urban Roadways in 2002: Using Archived Operations Data for Reliability and Mobility Measurement. US Department of Transportation, Federal Highway Administration Office of Operations, Washington, DC, March 2004.

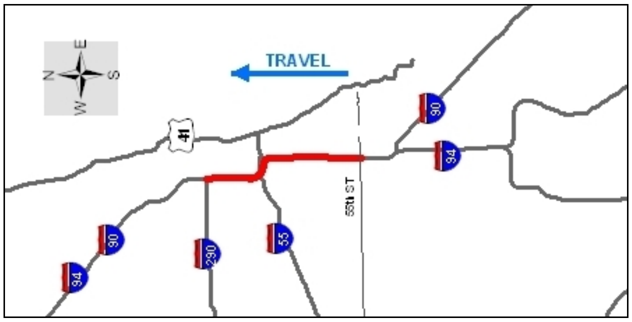
The remainder of this subsection of the report highlights the performance measures calculated for both directions of travel each corridor. Additional data on corridor operations can be found in Appendix A of this report.

#1a. I-90/94 Dan Ryan Express Lanes

55th Street to Circle Interchange

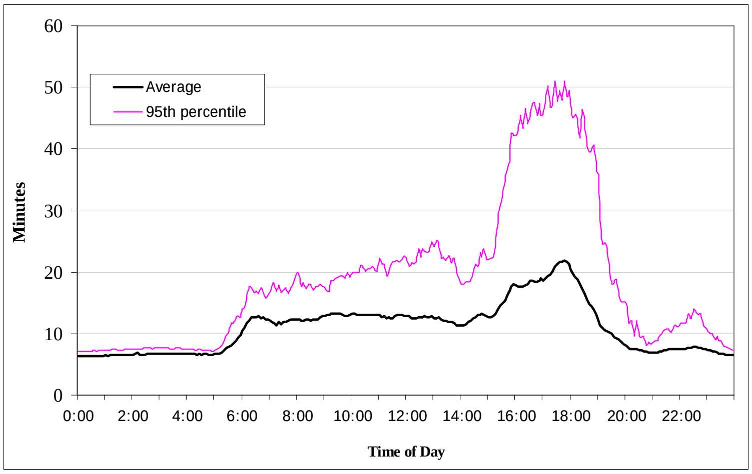
6.0 miles

Northbound traffic



Travel Time

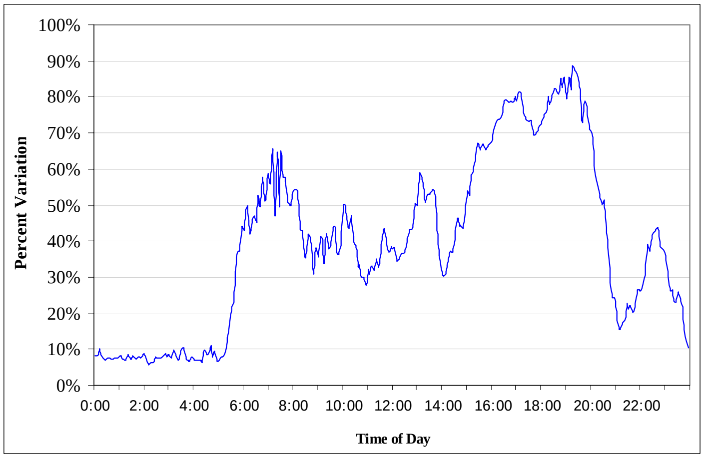
Northbound travel times on this portion of the Dan Ryan express lanes show three distinct time frames during the day. Travel times remained around 7 minutes during the late night/early morning hours. From the morning peak period until the evening peak, travel times still remaindered fairly constant at around 12 minutes. Peaking of the travel times finally occurred during the evening peak commute period.



The 95th percentile time showed little difference from the average travel time during the early morning hours. This time increased fairly steadily during the day and reached its peak around 5:30 PM. At its peak, the 95th percentile time was over 50 minutes: more than twice the average travel time.

Travel Time Reliability

Travel times were most unreliable during the evening peak period when variability was in the 80-90% range. This means the average variability in travel times during this time was nearly equal to the average travel time itself. There were also relatively high amounts of variability during the morning peak and the afternoon period.

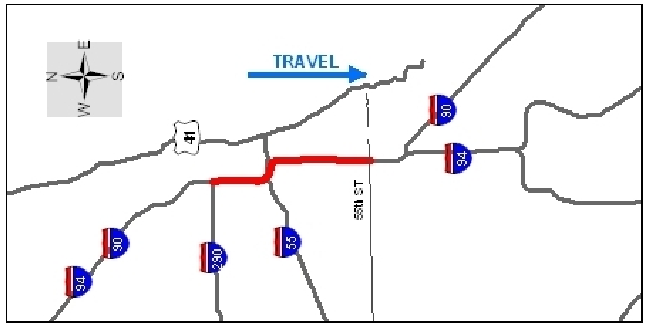


#1b. I-90/94 Dan Ryan Express Lanes

Circle Interchange to 55th Street

6.0 miles

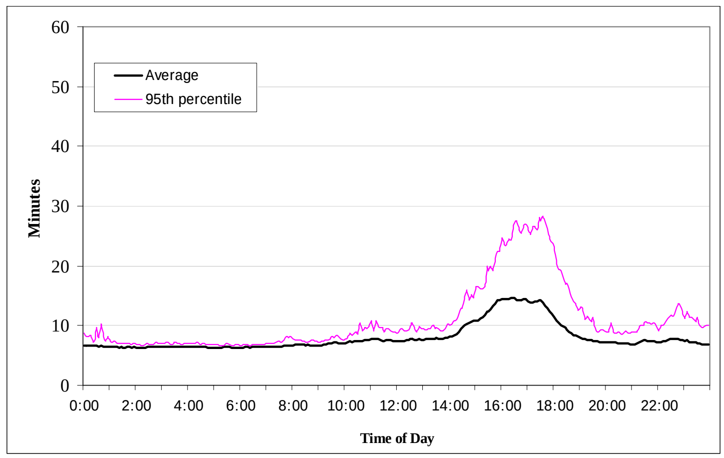
Southbound traffic



Travel Time

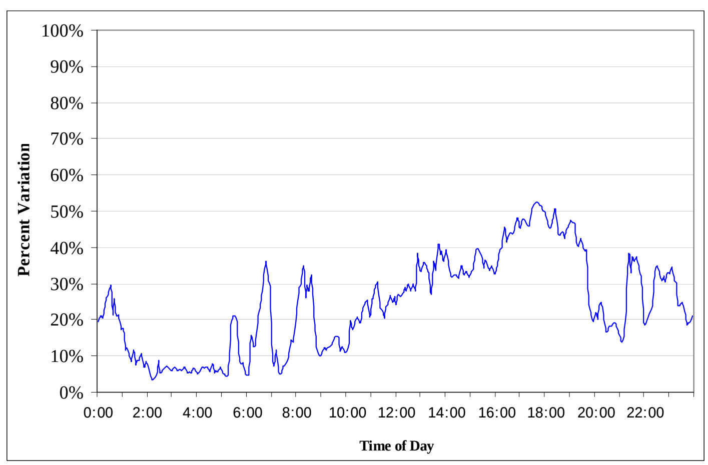
Southbound travel times differed somewhat from northbound for this corridor. Times remained virtually the same during the entire day except for the evening peak period. In general, southbound travel times were shorter than the northbound ones.

The 95th percentile travel time showed that less than 30 minutes would have to be allowed to make a trip in this corridor during the evening peak and be on-time 95% of the time. During most of the day, the 95th percentile time was 10 minutes or less.



Travel Time Reliability

Southbound traffic proved to be much more reliable than northbound on the Dan Ryan express lanes. A few spikes of unreliability occurred during the morning peak period. The amount of variability steadily increased from the morning peak through the evening peak. However, the overall level of unreliability was much less for southbound traffic than for northbound.

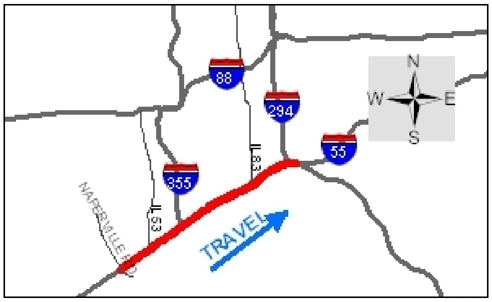


#2a. I-55 Stevenson Expressway

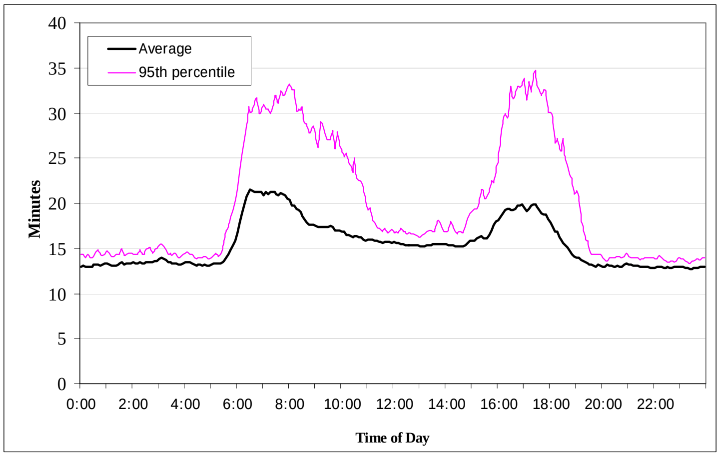
Naperville Road to I-294

12.7 miles

Northbound traffic



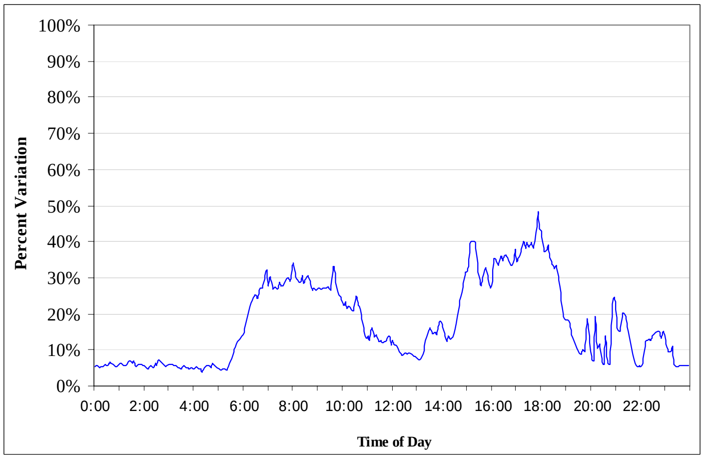
Travel Time



The travel time profile for northbound traffic in the Stevenson corridor showed a typical two peak pattern. Travel times were slightly longer during the morning peak than during the evening peak period. Travel times increased quickly beginning around 6:00 AM and then dropped off after 8:00 AM.

The 95th percentile travel time showed the greatest difference from the average travel time during the two peak periods. During the late night-early morning hours, the difference between the average and 95th percentile travel times was minimal. This was also true during the midday period.

Travel Time Reliability



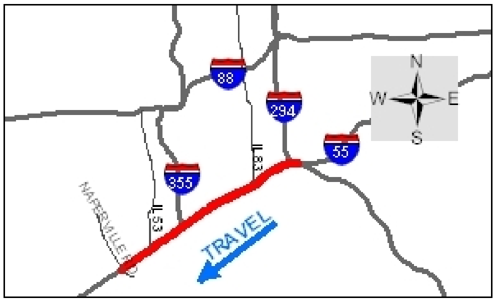
The travel time variability was highest during the evening peak period for northbound traffic, when it ranged from 30% to nearly 50%. The morning peak period had slightly less variable travel times, at around 30%. The late night hours after the evening peak showed fluctuating unreliability in travel times, while the early morning hours showed relative stability in travel times.

#2b. I-55 Stevenson Expressway

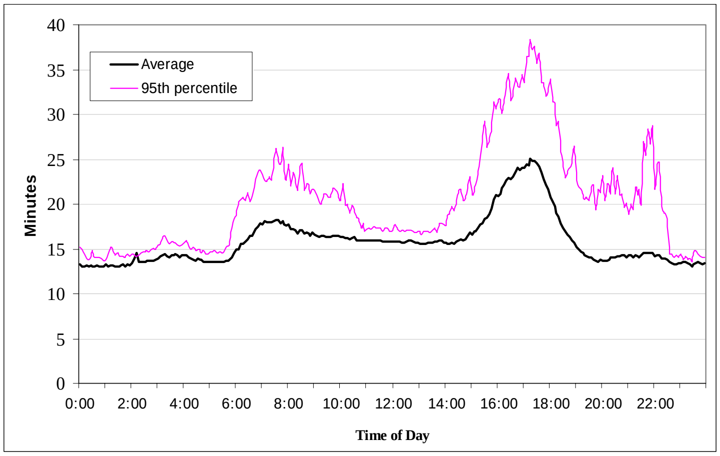
I-294 to Naperville Road

12.7 miles

Southbound traffic



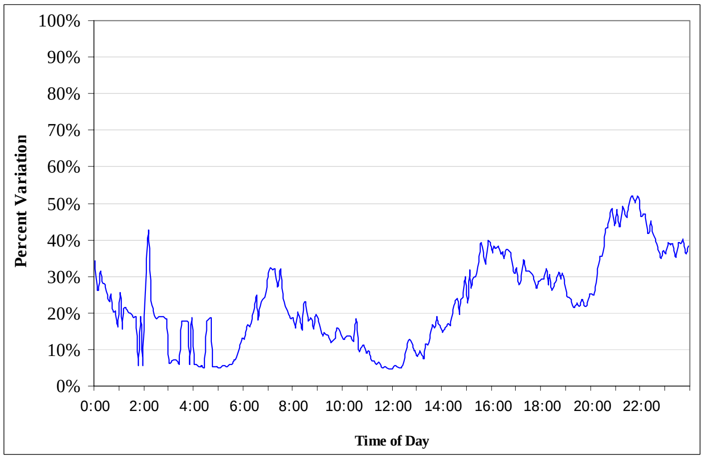
Travel Time



Average southbound travel times on this section of the Stevenson showed a much different pattern than northbound times. While the northbound travel times showed two fairly equal peaks, the southbound travel times showed evening peak travel times that were notably higher than the morning peak times. The average travel times increased less than five minutes between the early morning hours and the height of the morning peak.

The 95th percentile travel times were highest during the evening peak, when it approached 40 minutes. These times continued to be at relatively high levels following the evening peak until around 10:00 PM, when they dropped off precipitously.

Travel Time Reliability



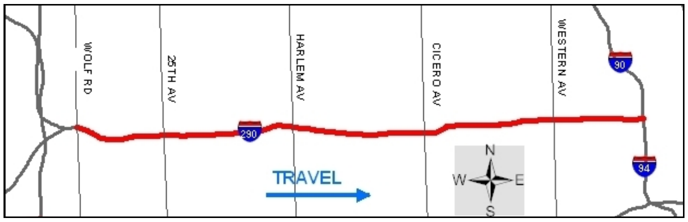
The travel time reliability pattern showed that the largest degree of variability occurred between 8:00 PM and midnight. There was a greater amount of travel time unreliability during the second half of the day than during the first. For most of the day, the percent variation remained under 30%, which would add less than three minutes to a ten minute trip.

#3a. I-290 Eisenhower Expressway

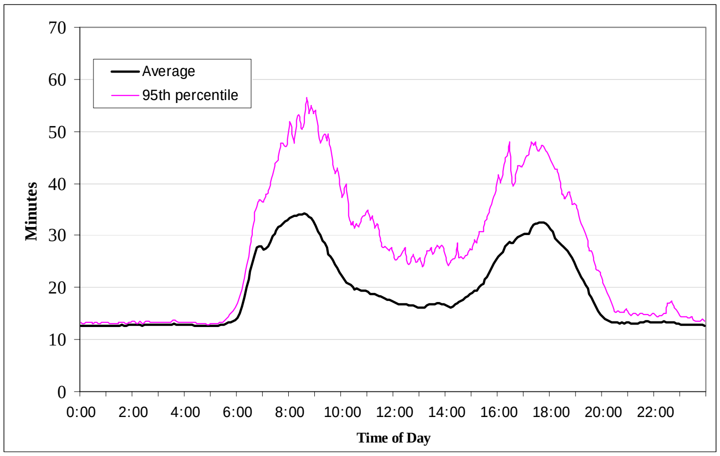
Wolf Road to Circle Interchange

13.4 miles

Eastbound traffic



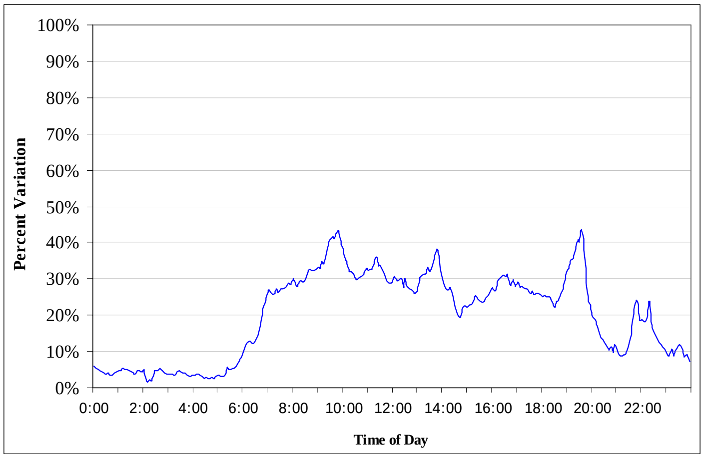
Travel Time



The travel time profile shows that the morning peak period for eastbound traffic begins around 6:00 AM and lasts nearly four hours. The evening peak period has a longer duration (roughly 3:00 PM to 8:00 PM) than the morning one; however, the travel times in the evening are not quite as long as in the morning.

The 95th percentile line indicates that the longest travel times during the year were experienced during the morning peak. While the average travel time was 33 minutes during the height of the morning peak, the 95th percentile travel time was around 55 minutes. Meaning that an extra 22 minutes of travel time would need to be factored into a trip at this time in order to arrive at the destination on-time 95% of the time. Prior to the morning peak period there is very little difference between the average travel time and the 95th percentile time.

Travel Time Reliability



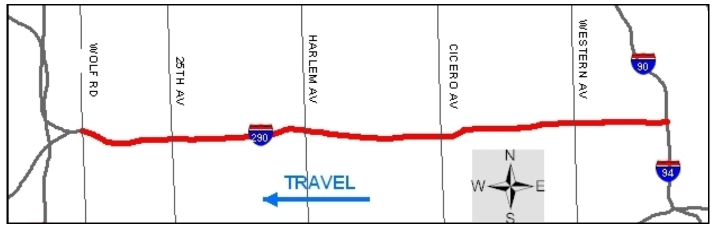
The travel time reliability graph shows that traffic flow was fairly stable in the early morning hours during the year. The unreliability or instability in travel times grew rapidly during the morning peak and continued throughout the day, finally declining after 7:30 PM. The two times when the variation was highest during then year occurred between 9:30 and 10:00 AM and between 7:25 and 7:40 PM. Both of these times are at the end of the peak travel periods.

#3b. I-290 Eisenhower Expressway

Circle Interchange to Wolf Road

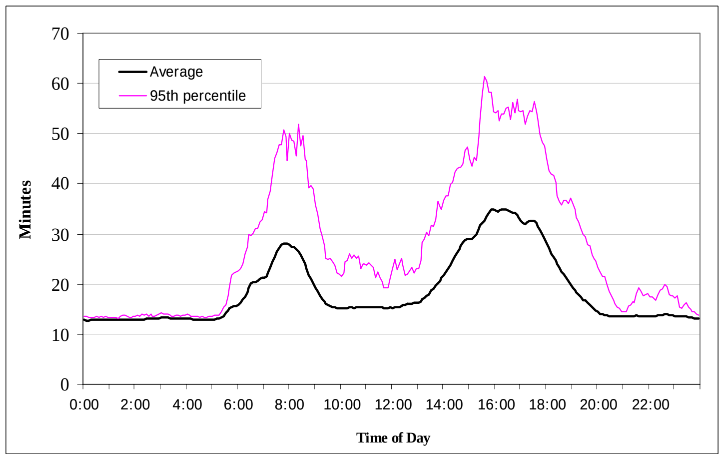
13.4 miles

Westbound traffic



Travel Time

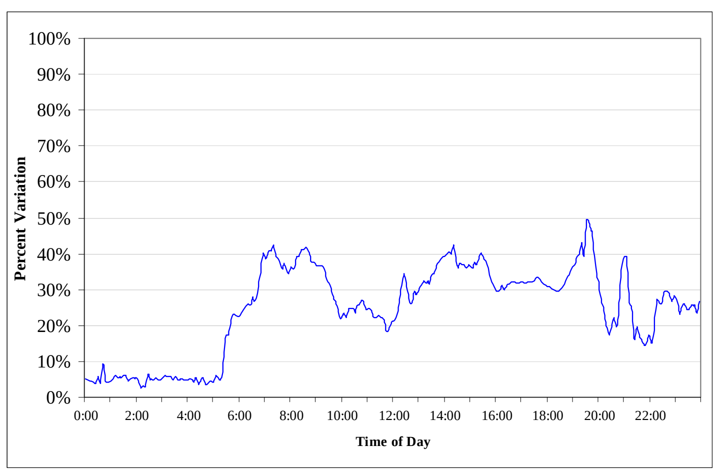
The average travel time line shows a somewhat different pattern for westbound traffic than it did for eastbound. In this direction the evening peak period has a longer duration than the morning one and drivers experience longer travel times than during the morning. The average evening peak travel times top out at around 35 minutes, while morning travel times are less than 29 minutes.



The 95th percentile line shows that the longest travel times occurred during the evening peak period. Again, the largest differences between the average and 95th percentile travel times occurred during the peaks. Nearly 50 minutes of travel time in the morning and 60 minutes during the evening had to be allowed for in order to be on-time 95% of the time.

Travel Time Reliability

Travel time reliability for westbound traffic was similar to that for eastbound vehicles. The most reliable travel times were experienced before the morning peak began. Travel time reliability increased following the morning peak (show by the declining percent variation), and then became more unreliable beginning around noon. Interestingly, the period between 1:00 and 4:00 PM had more unreliable travel times than between 4:00 and 6:30 PM, which represents a large portion of the evening peak.

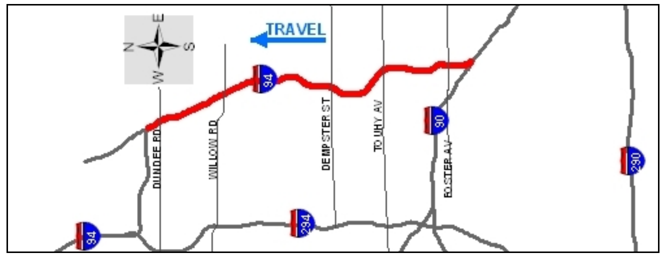


#4a. I-94 Edens Expressway

Junction to Edens Spur

13.4 miles

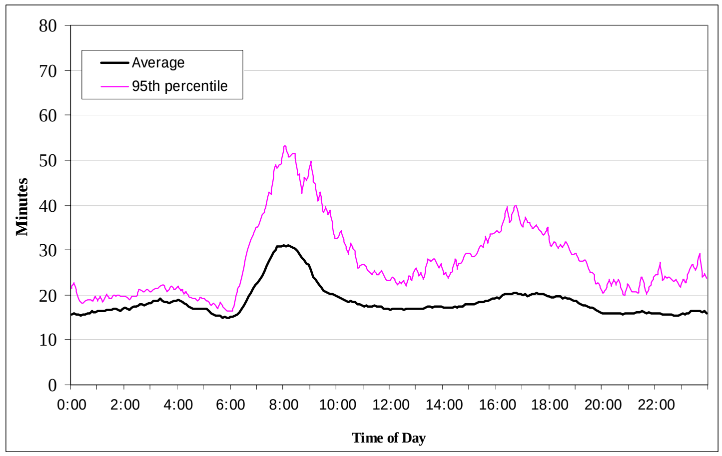
Northbound traffic



Travel Time

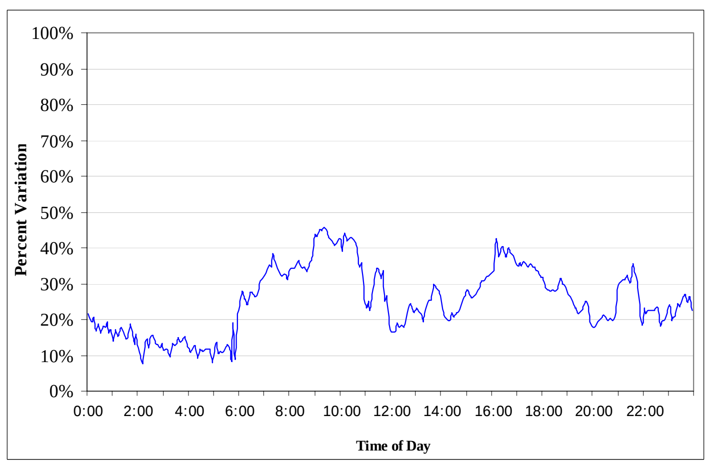
Average northbound travel times in the Edens corridor showed an unusual pattern. Travel times remained fairly constant (within a five minute range) during the day except for a spike during the morning peak. Average travel times during the morning peak nearly doubled to over 30 minutes.

The 95th percentile travel time showed that the morning peak had the worst travel times, exceeding 50 minutes. After the morning peak, the 95th percentile travel times remained high for the rest of the day.



Travel Time Reliability

Travel times were most unreliable during the morning peak. The reliability improved somewhat during the midday period before worsening again during the evening peak. As with the other corridors, the travel time reliability was highest during the early morning hours.

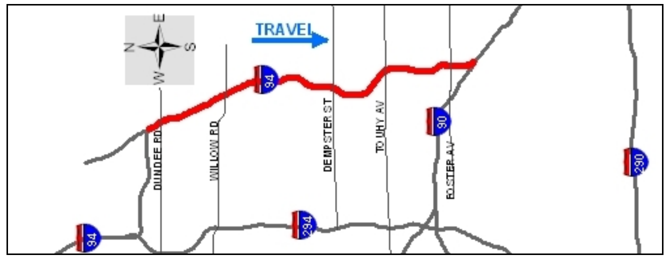


#4b. I-94 Edens Expressway

Edens Spur to Junction

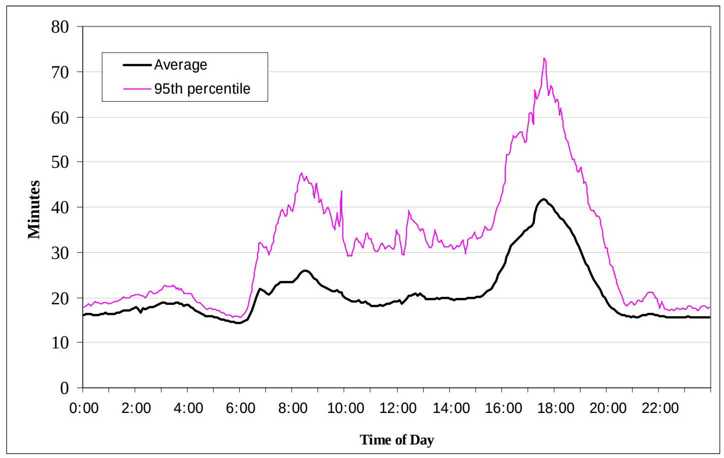
13.4 miles

Southbound traffic



Travel Time

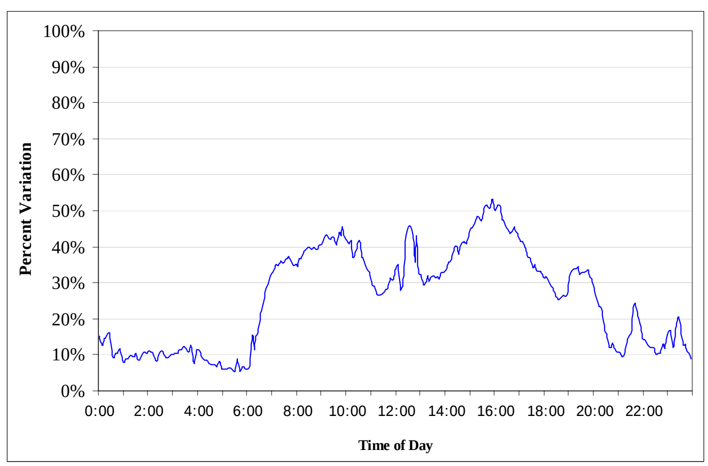
Southbound travel times in the Edens corridor were nearly a mirror image of the northbound times. The average travel time peaked during the evening period, with only a minor increase in times during the morning period. The average travel times were longer for the southbound traffic: for instance, 40 minute southbound travel times in the evening peak compared to 30 minute northbound travel times in the morning peak.



The 95th percentile travel times peaked at nearly 50 minutes during the morning and over 70 minutes during the evening. For much of the day, the 95th percentile travel time would have required adding at least 15 extra minutes on to the travel time to arrive on-time 95% of the time.

Travel Time Reliability

The travel time reliability pattern showed a good deal of unreliability beginning with the morning peak and continuing on through the evening peak. The most unreliability occurred during the evening peak when the percent variation reached 50%. The early morning hours showed fairly stable travel times.



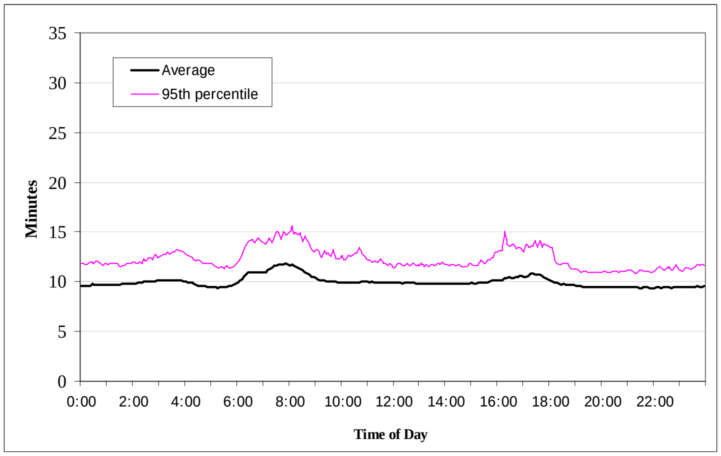
#5a. I-88 Ronald Reagan Memorial Tollway

Naperville Road to IL 83

9.5 miles

Eastbound traffic

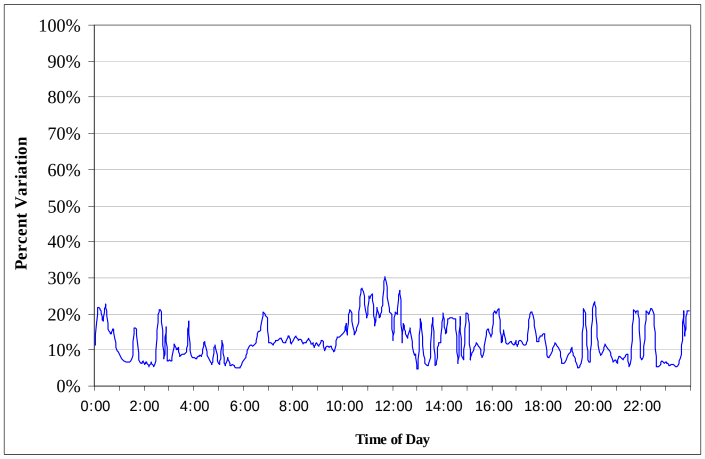
Travel Time



The average travel time profile for this corridor showed practically no variation throughout the day. The difference between the longest and shortest travel times during the day was only two minutes. For all practical purposes, eastbound traffic in this corridor did not experience any peak period slowdown.

The 95th percentile profile showed relatively little deviation from the average travel time. While the 95th percentile travel time did increase during the traditional morning and evening peak periods, only about three minutes was added to the trip. Essentially, 95% of the trips through his corridor could have been made in 15 minutes or less during any time of the day.

Travel Time Reliability



The travel time reliability measure showed a fairly stable traffic flow. The travel time fluctuations remained within a relatively tight range throughout the day. Also, the morning and evening peak periods did not stand out as being times of unreliability.

#5b. I-88 Ronald Reagan Memorial Tollway

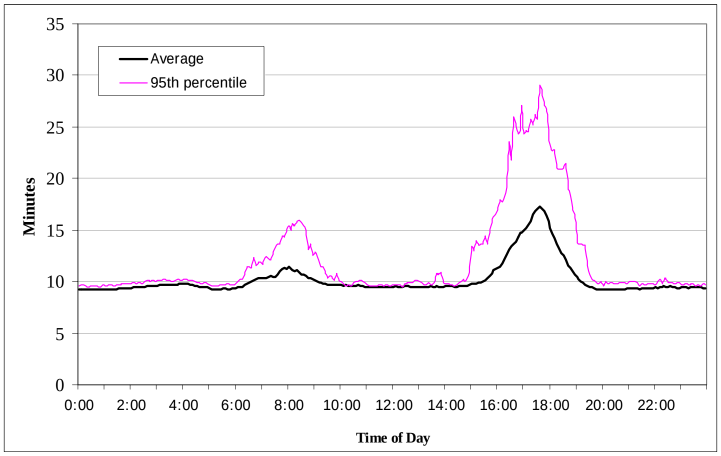
IL 83 to Naperville Road

9.5 miles

Westbound traffic

Travel Time

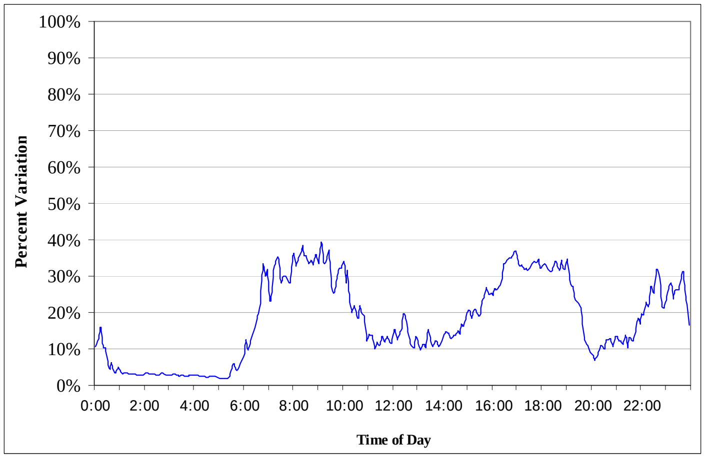
Westbound travel times in this corridor showed a much different profile than eastbound ones. While a morning peak was not prominently reflected in the travel times, there was a definite evening peak period. Non-peak travel times in this direction were the same as for eastbound traffic.



The 95th percentile travel time peaked at nearly 30 minutes during the evening rush. This was close to twice as long as the average travel time during this part of the day. During the morning peak, the 95th percentile travel time reached a maximum of just over 15 minutes.

Travel Time Reliability

Westbound traffic through this corridor experienced more travel time unreliability than the eastbound traffic. Travel times during both the morning and evening peak periods were equally unreliable. Travel times fluctuated by around 35% during both times of the day.

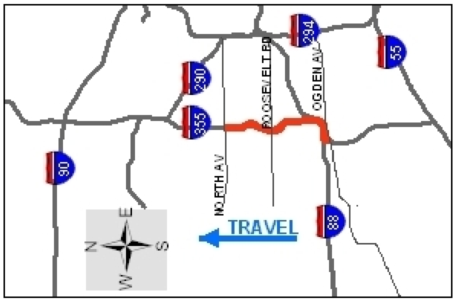


#6a. I-355 North-South Tollway

US 34 to IL 64

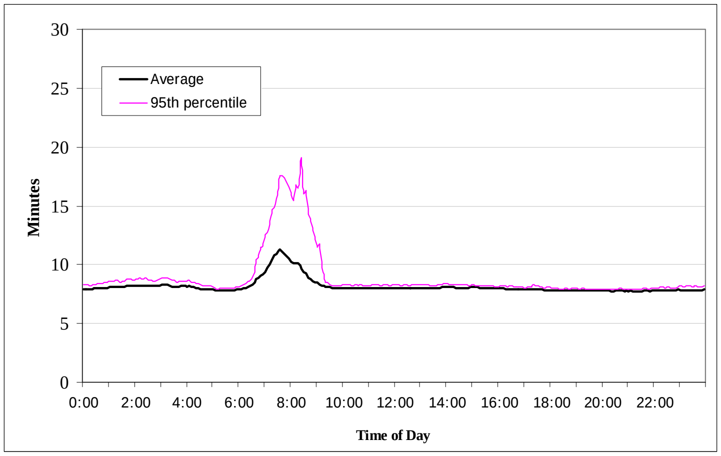
8.3 miles

Northbound traffic



Travel Time

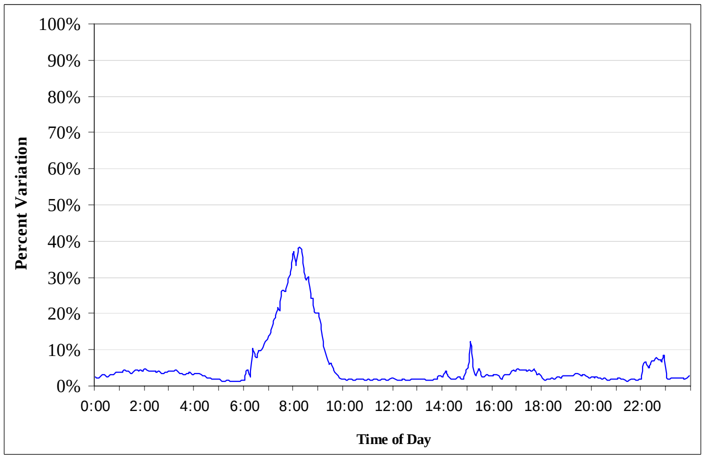
Northbound traffic on the I-355 corridor experienced a consistent travel time throughout the day except during the morning peak. Even during the morning rush, the average travel time only increased by 2.5 minutes. No evening peak period was indicated by the travel time profile.



The 95th percentile travel time followed the average travel time pattern and was fairly constant during most of the day. Ninety-five percent of the trips through this corridor could be made in less than 10 minutes except during the morning peak. During the morning rush, up to nine additional minutes of travel time would have been needed to be on-time 95% of the time.

Travel Time Reliability

The morning peak period was the only time to show any sustained unreliability in travel times. The fluctuation in travel times during the morning peaked at around 40% of the average time. Outside of a few anomalies, the fluctuation during the rest of the day stayed below 10% of the average time.

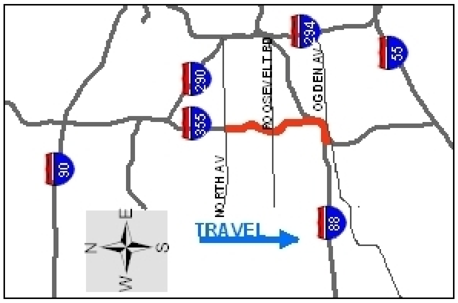


#6b. I-355 North-South Tollway

IL 64 to US 34

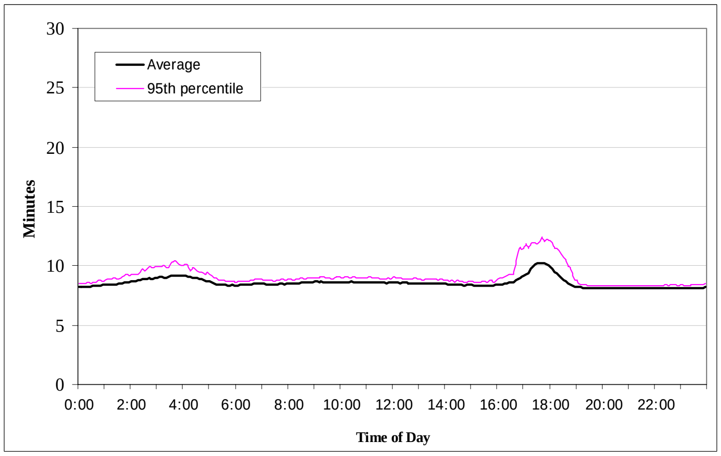
8.3 miles

Southbound traffic



Travel Time

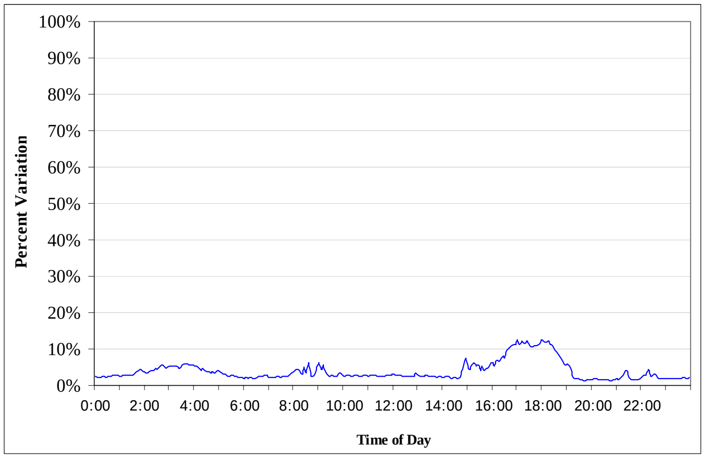
Southbound travel times in this corridor exhibited the opposite pattern of northbound times. There was no perceptible morning peak reflected in the average travel time profile. The evening peak was barely discernible in the travel times, as the times only increased by about two minutes.



Again the 95th percentile travel times showed very little deviation from the average times. Even during the evening peak, times were only about two minutes longer than the normal time. For a large portion of the day, 95% of the trips through the corridor could have been made in ten minutes or less.

Travel Time Reliability

The percent variation for this travel direction showed travel times remained reasonably stable. The evening peak period was the only time the normal amount of fluctuation was greater than 10%. For most of the day, the amount of fluctuation was less than half of that.

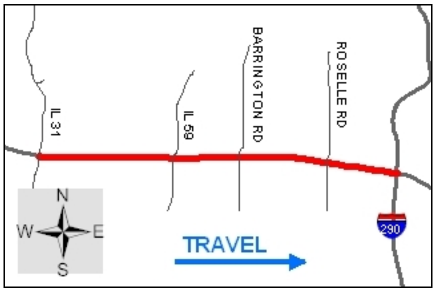


#7a. I-90 Northwest Tollway

IL 31 to I-290/IL 53

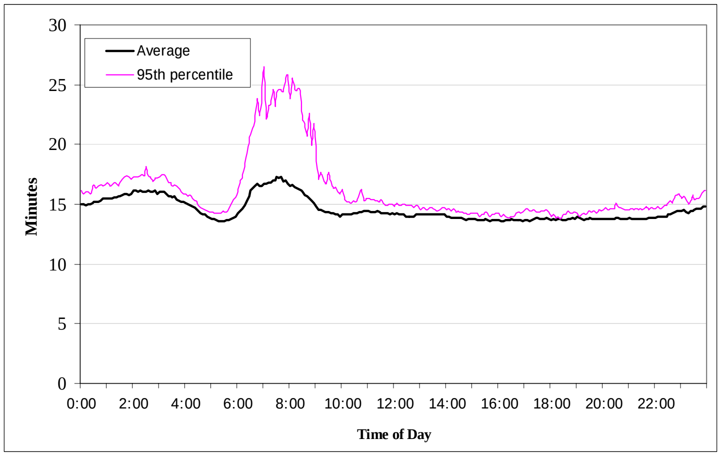
13.6 miles

Eastbound traffic



Travel Time

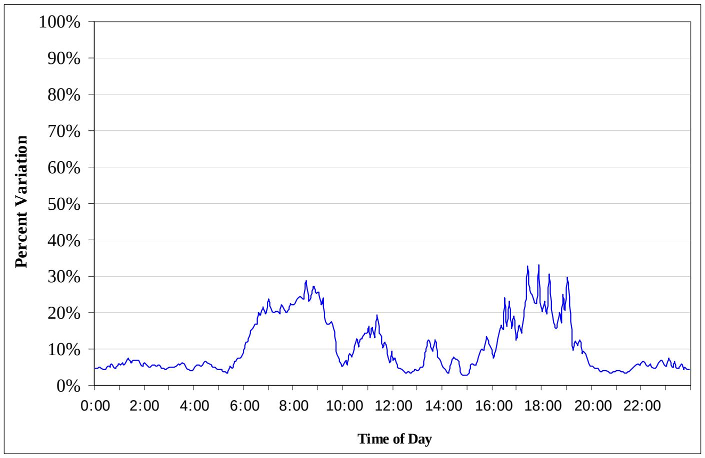
The travel time pattern for eastbound traffic in this corridor showed a morning peak period but no corresponding evening peak. The average travel times only increased by about three minutes during the morning peak. The unusual travel time peak during the early morning hours was most likely the result of overnight lane closures to perform roadwork.



The 95^{th} percentile travel time showed the worst case conditions were relatively stable during most of the day. Travel times would have only needed to be increased by around two minutes to ensure a trip was on-time 95% of the time for most of the day. During the morning peak period, an additional 8 minutes of travel time would have been needed to achieve 95% punctuality.

Travel Time Reliability

The percent variation measure showed that the morning and evening peaks experienced comparable levels of travel time unreliability. The average fluctuation in travel times during these periods was between 20%-30%. Two shorter periods of unreliability also occurred during the late morning and afternoon hours.

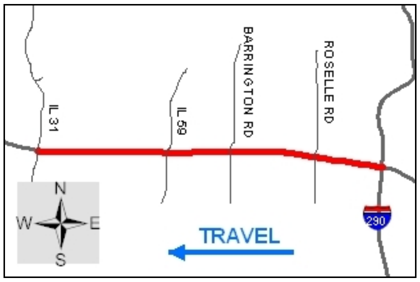


#7b. I-90 Northwest Tollway

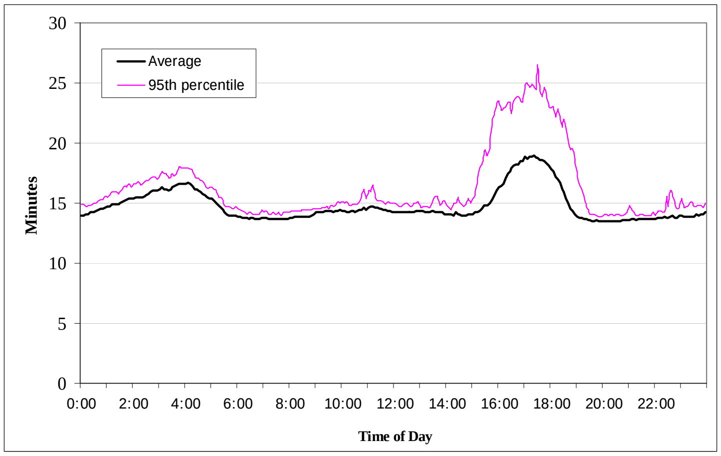
I-290/IL 53 to IL 31

13.6 miles

Westbound traffic



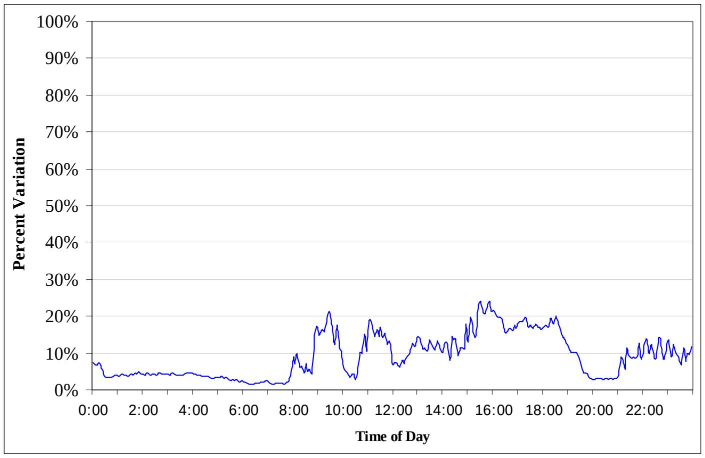
Travel Time



The travel time profile for westbound traffic showed the lack of a morning peak, but a definite evening peak period. Average travel time through the corridor increased from around 15 minutes during the midday to a peak of about 20 minutes during the evening rush. The small early morning peak in travel times was also present for westbound traffic. Again this was mostly likely caused by roadwork lane closures.

The 95th percentile travel time did not vary from the average travel time by much during most of the day. For a large portion of the day the difference between the two was only 1-2 minutes. The exception was during the evening peak when it was nearly 6 minutes longer than the average travel time.

Travel Time Reliability



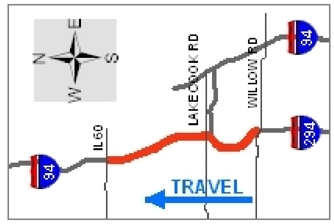
The reliability in travel times for westbound traffic in this corridor was quite stable during the first 8 hours of the day. While there was some travel time fluctuation during the morning and afternoon hours, the largest amount of prolonged instability occurred during the evening peak. Some instability was seen during the late night/early morning but this was most likely due to roadwork.

#8a. I-94/294 Tri-State Tollway

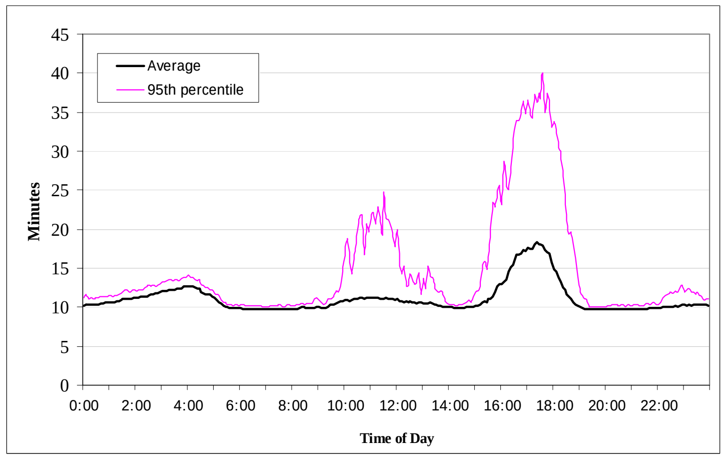
Willow Road to IL 60

10.0 miles

Northbound traffic



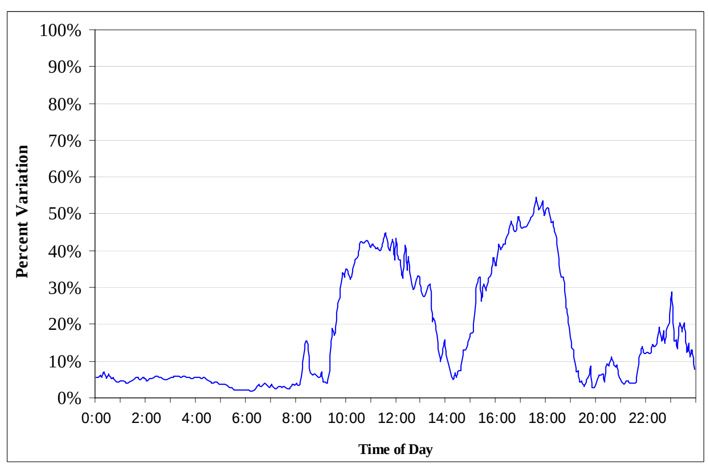
Travel Time



Northbound traffic in this Tri-State corridor did not experience any morning peak increase in average travel times. There was a slight increase in travel times during the midday period, but the major spike in travel times occurred during the evening peak period. As with the Northwest Tollway corridor, this one also had an early morning increase in travel times that were most likely the result of overnight roadwork.

The 95th percentile travel time was twice as long as the average travel time during the evening peak period, rising to 40 minutes. The 95th percentile travel time was also nearly double the average travel time during the midday period, reaching a height of 25 minutes. Outside of those two time period, the 95th percentile travel time was not significantly different than the average travel time.

Travel Time Reliability



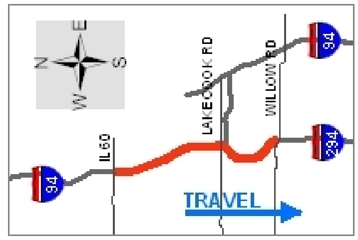
There were two distinct time periods of travel time unreliability for this corridor. During the midday period, average travel times fluctuated by up to 40%. This was surpassed during the evening peak when times fluctuated by up to 50%. Some travel time instability was also experienced during the late night hours, most likely the result of roadwork.

#8b. I-94/294 Tri-State Tollway

IL 60 to Willow Road

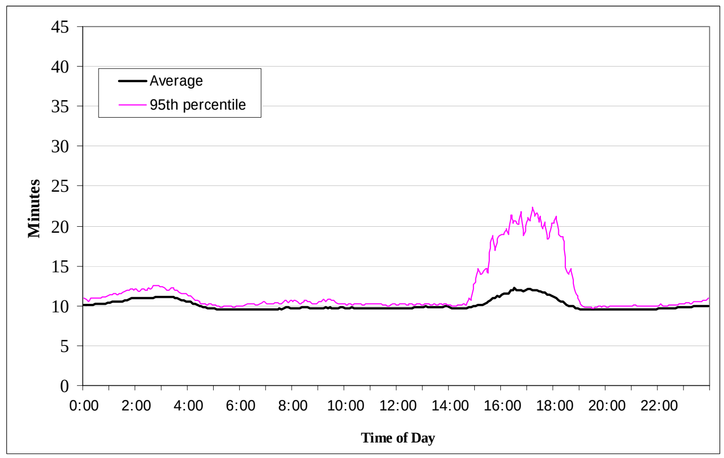
10.0 miles

Southbound traffic



Travel Time

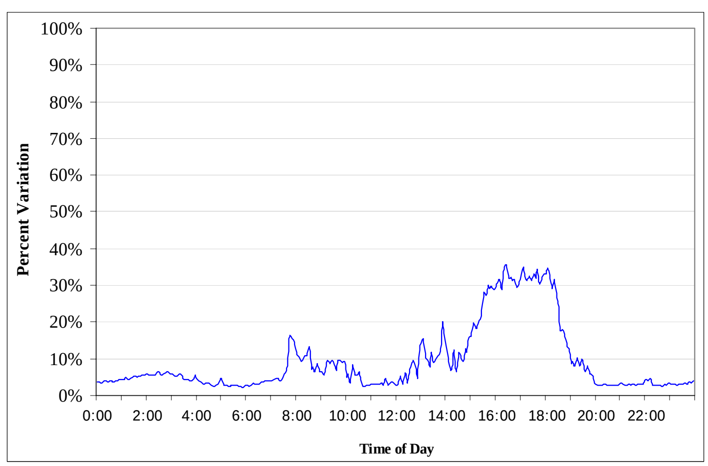
Southbound traffic in the Tri-State corridor experienced a much different travel time profile than northbound traffic. Travel times remained relatively constant throughout the day. The travel times showed a relatively minor evening peak, with times not significantly different than the remainder of the day. Again overnight roadwork and lane closures were probably the cause of the early morning peak in travel times shown.



The 95th percentile travel times did not differ much from the average travel times during most of the day. The 95th percentile times showed a definite evening peak in travel times. The 95th percentile travel times were close to 20 minutes during the evening peak, nearly double the average times.

Travel Time Reliability

Southbound travel times in the Tri-State corridor showed greater reliability than the times for northbound traffic. The most unreliable travel times (varying from the average travel time by around 30%) were experienced during the evening peak period. This was still less travel time instability than northbound traffic experienced.



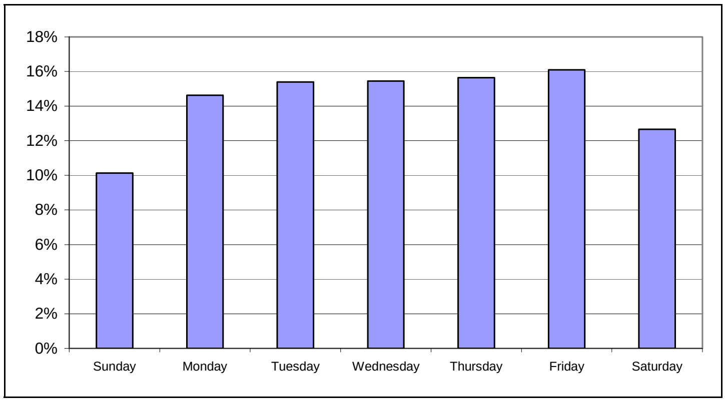
3.3 Arterials

The arterial system in northeastern Illinois is not covered by a system of detectors as extensive as those on the expressways. However there are permanent traffic counting stations on arterials throughout the region that collect data for the Highway Performance Monitoring System (HPMS). Data from these count stations can provide insight into the operation and use of the arterial system.

Traffic Variations by Day of the Week

The hourly traffic volumes at 34 traffic-counting stations in urban areas of northeastern Illinois were analyzed for the time period between July 1, 2004 and June 30, 2005 (see Appendix D for a listing of the locations). Figure 3-8 shows the percentage of weekly traffic that occurred on each day of the week. The largest average volume of traffic occurred on Friday while the smallest average volume took place on Sundays and Saturdays. The average traffic counts were very similar for Tuesdays, Wednesdays and Thursday and were slightly less than on Fridays. Monday had the lowest traffic counts of the typical workweek. This seems reasonable considering how frequently holidays fall on Mondays and these days have lower traffic volumes, similar to the weekends. While the expressway system only varied about 3% between Wednesday and Saturday traffic volumes, the arterial traffic was over 20% higher on Wednesdays compared to Saturdays.

Figure 3-8. Percentage of Weekly Traffic by Day

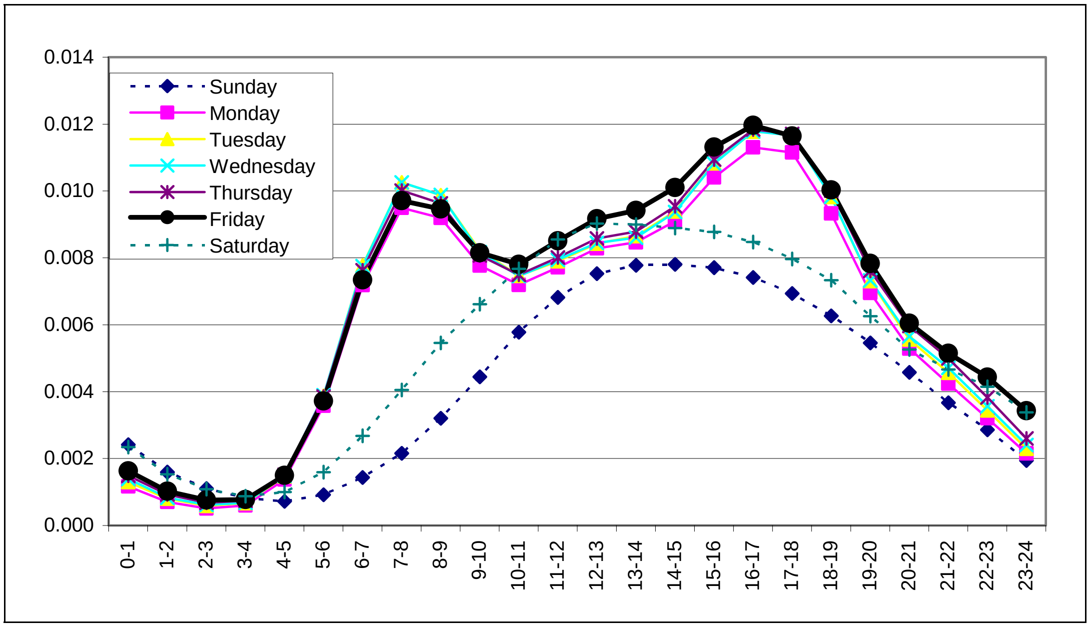


Traffic Variation by Hour of the Week

Figure 3-9 delves a little deeper into the data and examines the daily arterial traffic patterns by plotting the weekly share of traffic that occurred each hour of the day. The traffic pattern for Monday through Friday was very similar for each day. A morning peak period was reflected by high traffic counts between 6:00 AM and 8:00 AM. Following a drop-off in volumes that reached its lowest point between 10:00 AM and 11:00 AM, traffic increased steadily until it rose to the same volume as the morning, between 2:00 PM and 4:00 PM. After this point the traffic volumes remained higher than the morning rush for the next three to four hours. Traffic volumes were heaviest between 4:00 PM and 5:00 PM. During this time period the traffic volumes were nearly 20% higher than the busiest hour in the morning peak period.

The traffic flow on Saturday and Sunday was quite different from the rest of the week. There was no morning or evening peak period. Traffic volumes slowly built during the morning and peaked in the early afternoon before tapering off again. The traffic volume on Saturdays between 10:00 AM and 2:00 PM was similar to the traffic flow on Fridays, which was greater than during the other five days of the week. The traffic flow during the Saturday afternoon peak varied by more than the traffic volumes in the same time period during the rest of the week[14]. Sunday had the same traffic pattern as Saturday but with lower volumes. Sunday registered the lowest hourly traffic volumes of any day of the week for each hour between 5:00 AM and midnight.

Figure 3-9. Daily Arterial Traffic Patterns



The late evening/early morning hours between midnight and 4:00 AM had the lowest traffic volumes of the 24-hour period. Traffic volumes were highest during this time period on early Saturday morning and early Sunday morning. The Saturday and Sunday traffic volumes between midnight and 1:00 AM were almost twice as high as the volumes on Monday through Thursday during that time. More than half of the arterial traffic during the week occurred between 11:00 AM and 7:00 PM.

The expressway system experienced a ratio of 7:1 between the volume of traffic during its peak hour and lowest volume hour (see section 3.2.1.). For the arterial system, the weekdays had an average ratio of 19:1 between the lowest and highest volume hour for each day. The weekends experienced a ratio of 11:1 for this same measure.

Monthly Variation in Arterial Traffic

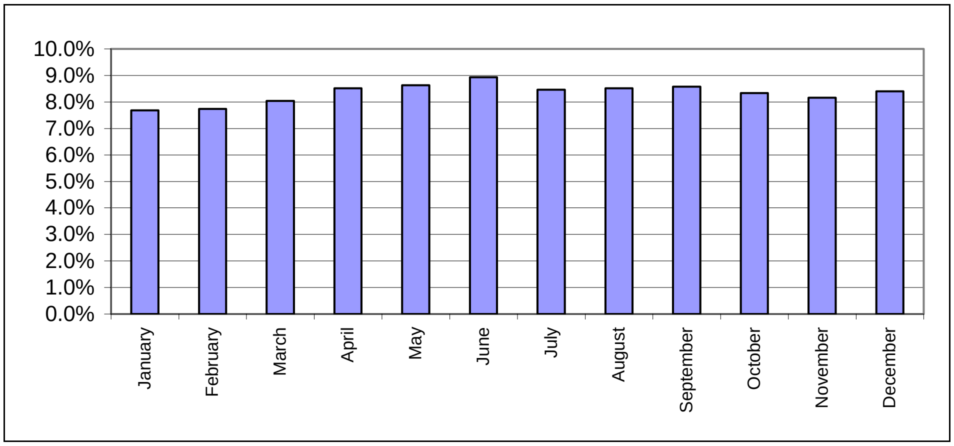
Arterial traffic volumes in northeastern Illinois did show monthly variation. IDOT analyzed traffic count data at 30 continuous count sites during 2001 through 2004[15]. As shown in Figure 3-10, the highest traffic volumes occurred in the summer months, with June having the highest

[14] There was more variation in traffic volumes during the Saturday peak than on other days. The standard deviation for the traffic volumes between 1:00 PM and 3:00 PM Saturdays was equal to 29.2% of the average traffic volume versus 25.8% for Monday through Friday and 27.7% on Sunday.

[15] Illinois Department of Transportation. Illinois Travel Statistics 2004. State of Illinois Department of Transportation, Office of Planning and Programming, Springfield, IL. 2004.

traffic counts of the year. The lowest volumes were experienced in January, February and March. The lowest monthly traffic flows were in January, which were 16% below June totals.

Figure 3-10. Monthly Arterial Traffic Variation



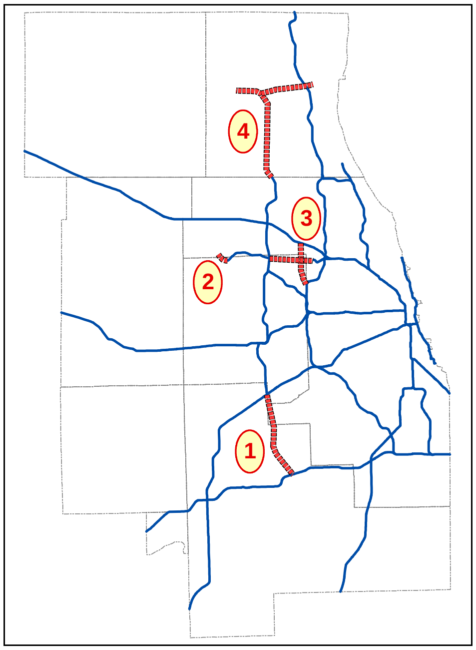
(This page left intentionally blank.)

4 Future Conditions

This section of the Status Report looks toward the future. Statistics from CATS' travel demand estimation models provide for an analysis of forecast roadway congestion for the year 2030. These data are compared to estimates for 2005 in order to examine the growth in traffic congestion.

4.1 Travel Demand Model Results

Figure 4-1. New Highway Facilities

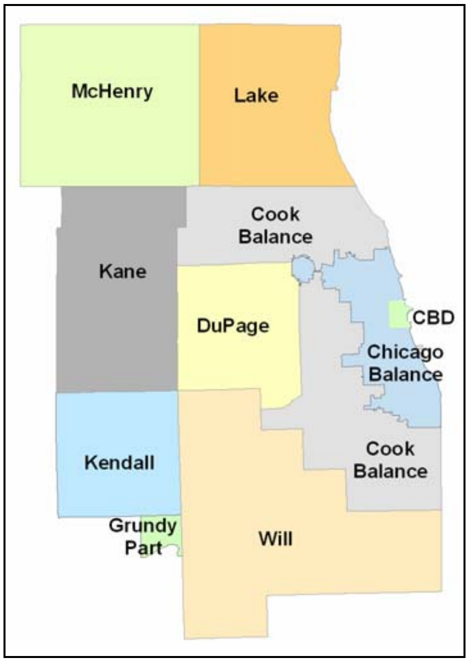


All data were obtained from CATS' 2003 Air Quality Conformity Analysis. Current roadway conditions are represented in the 2005 analysis network, and are compared to the future scenario results of 2030. Results are provided for two types of roads: arterials and expressways. In CATS' model highway networks the expressway category includes Interstate highways, toll highways and other access-controlled facilities with similar operating characteristics (such as the Elgin-O'Hare Expressway, and portions of Lake Shore Drive, IL 38, IL 56, IL 83, the Amstutz Expressway and US 20). Arterials are the surface streets in the network.

Figure 4-1 shows the portion of the expressway system included in CATS' model network that lies within the seven-county CMS region. This figure also indicates major roadway facilities not currently in existence that are expected to be carrying traffic by 2030. These facilities are:

1. I-355 extension from I-55 to I-80.
2. Elgin-O'Hare Expressway extension from Hanover Park to Streamwood.
3. O'Hare International Airport western bypass from I-294 to I-90; Elgin-O'Hare Expressway extension from IL 53 to airport bypass; and O'Hare western access road.
4. IL 53 extension from Lake-Cook Road to IL 120 and I-94.

Figure 4-2. CMS Summary Areas



CMS statistics are reported for ten summary areas (shown in Figure 4-2). Six of the summary areas represent an entire county in northeastern Illinois and one represents a single township in Grundy County. The remaining three areas together comprise Cook County, which is divided into the following areas: Chicago's Central Business District (CBD), the remaining balance of Chicago and the remaining balance of Cook County. The boundaries of the CBD are formed by North Avenue on the north, Ashland Avenue on the west, Cermak Road on the south and Lake Michigan on the east.

This section focuses on two measures of roadway use: daily vehicle miles of travel (VMT) and daily vehicle hours of travel (VHT). Statistics are reported separately for arterials and for expressways. Congestion on a roadway segment is measured when the volume of vehicles on the segment exceeds its capacity, i.e., the ratio is greater than one.

The modeled traffic data suggest that daily VMT on the region's arterials will increase by about 20% between 2005 and 2030, from 105 to 125 million vehicle miles. The number of congested daily vehicle miles on the arterials is expected to increase from 11.8 million to 16 million during this period. Daily expressway VMT for the region is expected to grow to 54.4 million vehicle miles, an 18% increase over 2005. Nearly 6.4% of daily expressway VMT is expected to be congested in 2030.

4.2 2005 Congestion

Table 4-1 shows the daily arterial congestion modeled for 2005. The largest number of congested vehicle miles was present in the Cook County Balance area, which is the portion of the county outside of the City of Chicago. This area also had the most traffic, as indicated by its large VMT number. The areas with the next largest amounts of congested VMT were Lake County and the non-CBD portion of Chicago. These three areas accounted for over 75% of the congested VMT in the entire region. Just over 11% of the total arterial VMT in the region was congested.

Table 4-1. 2005 Daily Arterial Congestion

	Arterials			
	Total VMT	Congested VMT	Total VHT	Congested VHT
01. CBD	1,714,719	287,908	190,361	76,044
02. Chicago balance	15,826,322	2,507,657	1,066,932	354,682
03. Cook Co. balance	33,871,677	3,804,974	1,598,555	394,179
04. DuPage Co.	14,658,552	1,511,939	633,250	142,819
05. Kane Co.	7,950,607	377,724	270,202	29,899
06. Kendall Co.	1,784,084	89,170	54,011	6,602
07. Lake Co.	13,895,155	2,607,413	637,438	251,710
08. McHenry Co.	6,463,896	345,186	204,101	29,720
09. Will Co.	8,637,391	292,405	269,452	23,457
10. Grundy Co. part	117,436	0	2,774	0
Total	104,919,839	11,824,376	4,927,076	1,309,112

In comparison, almost 27% of the region's arterial vehicle hours were congested. Nearly 40% of the vehicle hours traveled in the CBD and in Lake County were congested. Approximately 25% of the VHT in the Cook County balance was congested.

The daily expressway congestion for the region for 2005 is shown in Table 4-2. Total expressway vehicle miles traveled for the region were about half that of arterial vehicle miles. Just over 20% of the expressway VMT in the CBD was congested, and nearly 15% of the Chicago balance expressway VMT was congested. Due to the sheer amount of congested expressway VMT in the Chicago balance, this figure accounted for more than half of the region's congested expressway VMT. Overall, the region had more than twice as much arterial VMT as expressway VMT, and four times as much congested arterial VMT as congested expressway

Table 4-2. 2005 Daily Expressway Congestion

	Expressways			
	Total VMT	Congested VMT	Total VHT	Congested VHT
01. CBD	2,176,459	444,886	109,997	50,727
02. Chicago balance	11,032,806	1,491,735	528,623	268,465
03. Cook Co. balance	15,236,197	467,630	383,316	36,314
04. DuPage Co.	5,694,656	114,374	136,219	9,354
05. Kane Co.	1,570,543	0	28,831	0
06. Kendall Co.	79,149	0	1,286	0
07. Lake Co.	3,318,166	248,631	92,654	22,823
08. McHenry Co.	447,055	0	7,592	0
09. Will Co.	3,700,990	13,545	68,386	703
10. Grundy Co. part	81,511	0	1,346	0
Total	43,337,532	2,780,801	1,358,250	388,386

VMT in 2005.

The expressway VHT figures in Table 4-2 continue to highlight the Chicago balance area. More than half of the VHT in this area was congested, and it accounted for about 70% of the congested VHT for the entire region. Overall less than 30% of the daily expressway VHT in the region was congested.

4.3 2030 Congestion

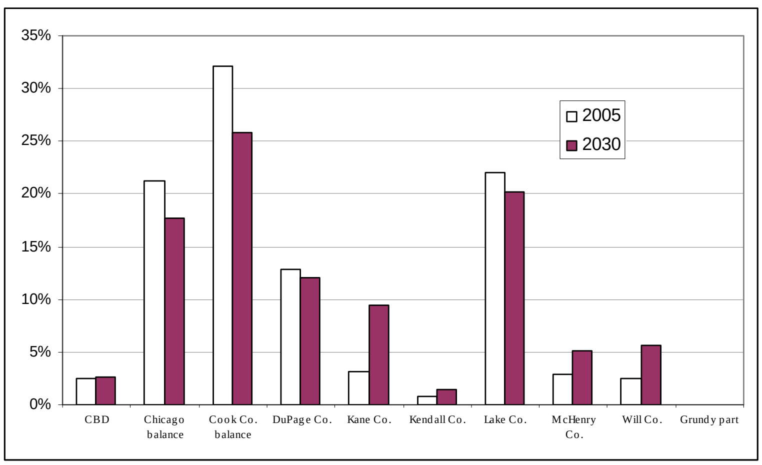
The daily arterial congestion figures forecast for the year 2030 are shown in Table 4-3. Arterial traffic is expected to increase nearly 20% between 2005 and 2030, to 125 million daily vehicle miles. The number of daily congested vehicle miles is expected to increase 36%, from 11.8 million to 16 million. The largest VMT increases are expected in Will and Kane counties, where VMT is predicted to increase by more than 50%.

Table 4-3. 2030 Daily Arterial Congestion

	Arterials			
	Total VMT	Congested VMT	Total VHT	Congested VHT
01. CBD	2,012,729	417,552	248,178	115,990
02. Chicago balance	17,251,628	2,840,345	1,183,836	410,927
03. Cook Co. balance	36,286,209	4,139,747	1,710,822	417,680
04. DuPage Co.	16,154,787	1,937,302	726,324	190,673
05. Kane Co.	12,011,947	1,506,639	462,192	124,499
06. Kendall Co.	2,573,592	220,835	81,617	15,240
07. Lake Co.	16,430,266	3,234,196	759,558	306,977
08. McHenry Co.	8,970,510	825,749	305,381	69,716
09. Will Co.	13,499,017	909,523	455,021	73,692
10. Grundy Co. part	145,505	0	3,522	0
Total	125,336,190	16,031,888	5,936,451	1,725,394

Figure 4-3 compares each area's share of the regional congested arterial VMT between 2005 and 2030. The largest increases in congested arterial VMT are expected to occur in the counties on the periphery of the region: Kane, Kendall, McHenry and Will. Each of these is predicted to have a larger portion of the region's congested arterial VMT in 2030 than they had in 2005. It should be noted that even though several areas are expected to have a declining share of the congested VMT in 2030, the amount of congested VMT overall and in each of the individual areas is anticipated to increase. The only exception is in the Grundy County township, which is not expected to experience any arterial congestion.

Figure 4-3. Congested Arterial VMT



The expected growth in congested VHT for arterials shows a somewhat different pattern. The most additional congested arterial vehicle hours between 2005 and 2030 are expected in Kane County, with over 94,000 more hours of delay. However, the next largest increases are suggested in the Chicago balance area and Lake County respectively.

Table 4-4 lists the daily expressway congestion for 2030. Expressway VMT for the region is forecast to increase from 43.3 million vehicle miles to 54.4 million. The largest VMT increases for the expressways are expected to occur in the Cook County balance and in Will County. Nearly half of the congested expressway VMT in the region is expected to occur in the Chicago balance area in 2030. Daily expressway VHT is expected to increase by 18% between 2005 and 2030 to 1.6 million vehicle hours.

Table 4-4. 2030 Daily Expressway Congestion

	Expressways			
	Total VMT	Congested VMT	Total VHT	Congested VHT
01. CBD	2,239,721	519,073	122,349	62,603
02. Chicago balance	12,281,689	1,716,521	518,751	225,256
03. Cook Co. balance	18,326,568	696,470	465,244	52,155
04. DuPage Co.	7,223,635	170,810	177,562	13,285
05. Kane Co.	2,126,772	109,540	45,719	6,053
06. Kendall Co.	88,962	0	1,456	0
07. Lake Co.	4,976,807	307,196	132,575	26,000
08. McHenry Co.	474,932	0	8,088	0
09. Will Co.	6,599,482	19,042	128,482	1,361
10. Grundy Co. part	96,745	0	1,708	0
Total	54,435,313	3,538,652	1,601,934	386,713

Additional information on modeled traffic conditions for 2005 and 2030 can be found in Appendix B. The appendix contains a series of tables providing information on lane miles, VMT, and VHT for the eight time-of-day periods analyzed in CATS' regional travel demand model. VMT and VHT are divided into automobile and truck components, and are reported separately for arterials and expressways.

5 Incident Case Study

Transportation professionals often discuss two types of congestion: recurring and non-recurring. Recurring congestion is the kind that occurs regularly because there are too many vehicles trying to use the roadway at the same time. This is the congestion experienced during the morning and evening peak periods, and can be seen in the travel time "bumps" in the corridor profiles in Section 3.2.2 of this report.

Non-recurring congestion results from temporary disruptions to the roadway's carrying capacity. The FHWA identifies four causes of non-recurring congestion: roadway construction, weather-related conditions, special events (such as sporting events, concerts, parades, etc.) and incidents[16]. A number of situations are covered by the term "incident" including traffic crashes, disabled vehicles, spilled cargo and other debris in the roadway. The FHWA estimates 25% of all congestion is incident-related[17].

The ability of a CMS to assess how much traffic congestion and delay is due to incidents would mark an advancement in our understanding of congestion. This case study was undertaken to determine the viability of using archived detector data to systematically analyze travel conditions for incident-related congestion. The main task of this case study (which is described on the following pages) was to examine the detector data around a known incident and see how the incident was reflected in the data. The next step (which is beyond the scope of this report) is to develop a process to identify and describe incident-related congestion in terms of frequency, duration and severity.

This case study examines a traffic crash that occurred on Tuesday, July 6, 2004. A tractor-trailer traveling eastbound on the Northwest Tollway (I-90) overturned near the Elmhurst Road exit. First reports of the incident were received around 11:45 AM. Police closed the entrance ramp from southbound Elmhurst Road to eastbound I-90 for several hours so emergency equipment could use it. The overturned vehicle was moved onto the shoulder by 1:15 PM, at which point all eastbound lanes were open to traffic. The scene was completely cleared by 4:00 PM. Data from Mobility Technologies' detectors were used to perform the analysis. Details of the incident were gathered from incident reports compiled by Mobility Technologies staff and an incident log provided by ISTHA.

Impact on Travel Speeds

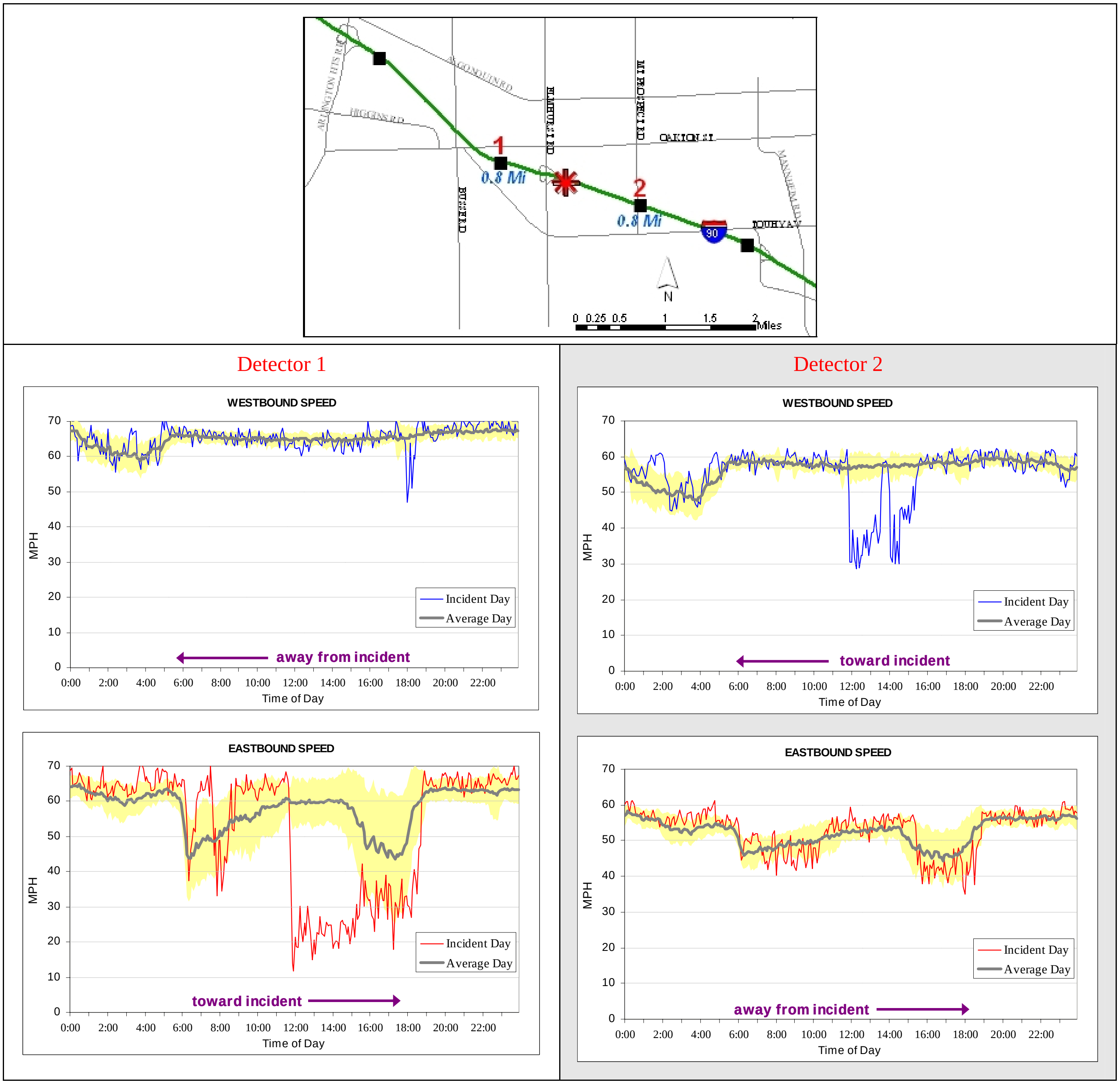
The top graphic in Figure 5-1 displays the area where the incident occurred on the Northwest Tollway. The incident (marked by the red asterisk) is in the center of the graphic near Elmhurst Road. The two black squares on either side of the incident labeled 1 and 2 mark the locations of the nearest Mobility Technologies detectors. Each one is located approximately 0.8 miles from the incident location.

---

[16] Federal Highway Administration. "Focus on Congestion" webpage available at www.fhwa.dot.gov/congestion/. July 2006.

[17] Ibid.

Figure 5-1. Immediate Vicinity Incident Impact



The left column under the graphic shows the eastbound and westbound travel speeds during the day at detector 1. The grey line indicates the average daily speed profile at the detector location for Tuesdays between July 1, 2004 and June 30, 2005, excluding holidays. The yellow area around the average speed represents the normal fluctuation in travel speeds at the location, and includes nearly 68% of the speed observations. In statistical terms, this area is one standard deviation around the average speed. The colored line (red for eastbound and blue for westbound) represents the travel speeds recorded on the day of the incident (July 6, 2004). For this case study, speed fluctuations outside of the normal range (outside of the yellow area) will be considered to indicate an incident.

The traffic most directly affected by the incident was eastbound at detector 1 and westbound at detector 2. Beginning with the eastbound traffic at detector 1 (traffic headed toward the incident location), travel speeds seemed fairly normal until around 11:30 AM. In fact, speeds were faster than normal for most of the first eight hours of the day. At around 11:30 AM (just before the incident was first reported), travel speed dropped to just over 10 miles per hour. Eastbound speeds at this location stayed well below normal until the evening peak began, and did not return to normal and stabilize until around 7:00 PM.

Westbound speeds at detector 2 (measuring traffic headed toward the incident) showed a significant drop between 11:45 AM and 3:30 PM. Average travel speed was down to 30 miles per hour during this period, which was substantially higher than the eastbound speeds at detector 1 during the same time. This westbound speed drop would commonly be termed “gaper’s delay”.

Westbound speeds at detector 1 (measuring traffic already past the incident location) showed no real impact from the incident. There was a drop in speed down to 50 miles per hour between 6:00 PM and 6:30 PM, but it is seems likely this was the result of a different incident upstream from this location. Similarly, eastbound speeds at detector 2 showed no real impact from the incident.

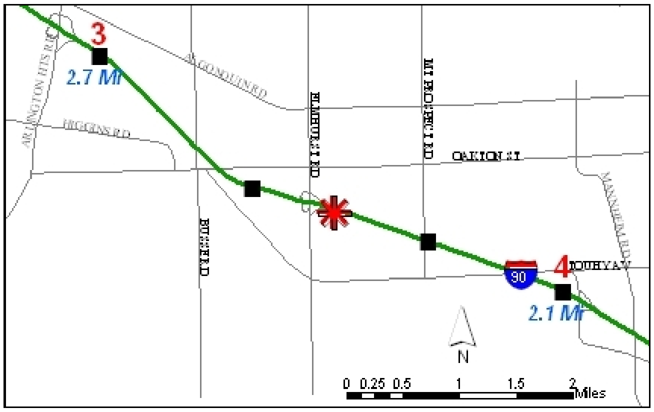
Figure 5-1 shows the impact the incident had on travel speeds in the immediate vicinity. The next step was to get a sense of how far away the impact was felt. Figure 5-2 shows the next tier of detectors traffic would encounter. These are the second closest detectors to the incident and are over two miles away from the location.

Eastbound speeds at detector 3 (traffic headed toward the incident) dropped to just over 10 miles per hour beginning around noon. These speeds stabilized around 3:15 PM. While this pattern was similar to eastbound speeds at detector 1, the travel speed at this location showed much greater fluctuation during the incident.

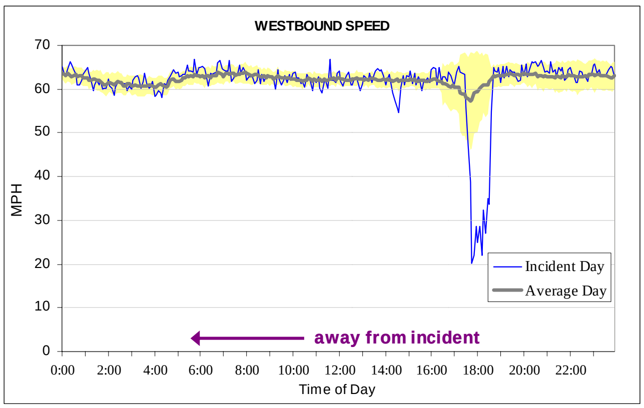
Westbound speeds at detector 4 dropped to 20-30 miles per hour beginning around noon. Speeds at this location did not stabilize until after 4:00 PM, during the evening peak. Interestingly, westbound speeds at this location during the incident were lower than westbound speeds at detector 2, which was 1.3 miles closer to the incident. There appears to have been an earlier incident affecting speeds between 7:30 AM and 9:00 AM.

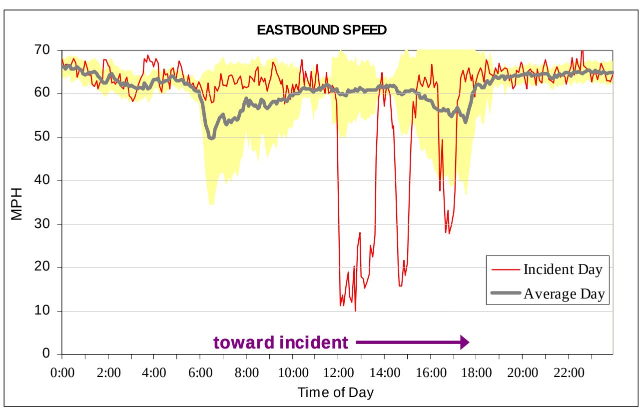
The westbound traffic at detector 3 and eastbound traffic at detector 4 did not seem to be greatly impacted by the incident. The big drop in westbound travel speed at detector 3 between 5:30 PM and 6:45 PM corresponds to a report of a disabled westbound vehicle near Arlington Heights Road.

Figure 5-2. Outlying Vicinity Incident Impact

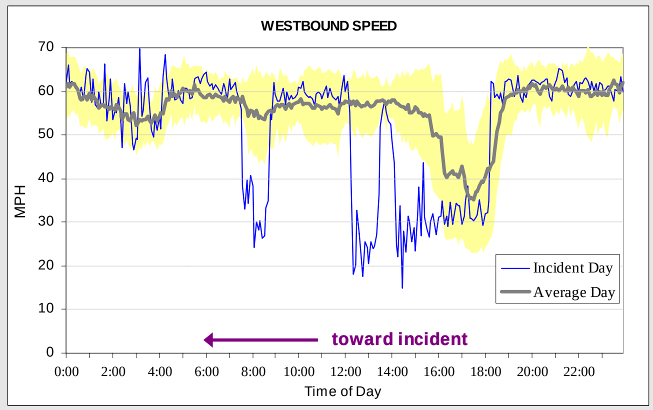


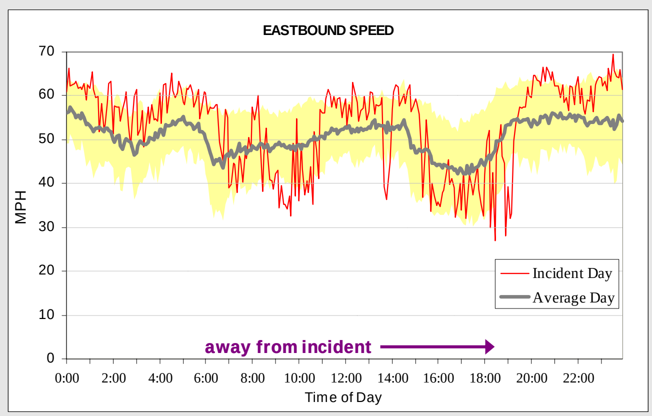
Detector 3





Detector 4

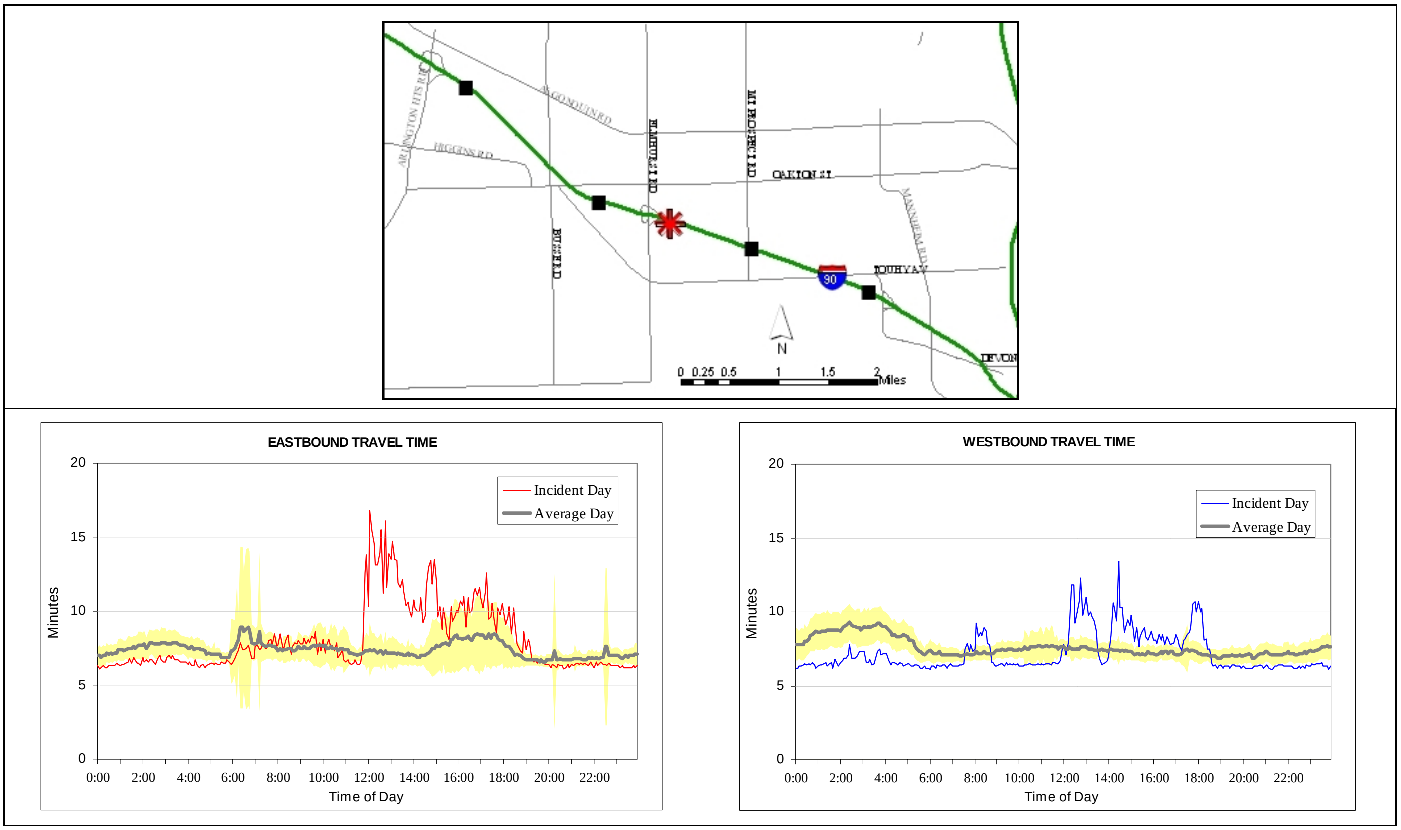




Corridor Travel Time

As noted in Section 3, travel time is the preferred measure of reporting traffic conditions. In order to translate these speeds at individual locations into a travel time, an I-90 corridor from Arlington Heights Road to Devon Avenue was created. This corridor is 6.5 mile long, with the incident located approximately at its center. Figure 5-3 shows how the detector travel speeds convert to a corridor travel time.

Figure 5-3. Incident Corridor Travel Time



The eastbound travel time increased significantly after 11:30 AM and stabilized after the evening peak started. During the beginning of the incident, travel times more than doubled. The westbound travel times through the corridor also increased after 11:30 AM, although the severity was less than that experienced by eastbound traffic.

Next Steps

Based on this case study, it appears feasible to use this data to try to assess the impact incidents have on congestion. A proposed methodology is to identify occasions where travel time in a corridor on a specific day exceeds one standard deviation above the average travel time for the corridor. Instances where a minimum specified number of consecutive 5-minute periods meet this condition could be tagged as incident-related congestion. This would allow for calculations of incident duration and severity. Use of the volume data collected by detectors would allow for calculations of incident-related delay.

Use of this methodology may under represent incident delay as the most severe incidents may not be reflected in the detector data. IDOT's current detector failure management process runs every

20 second data poll[18]. Raw detector data are evaluated against average volumes and occupancies, with a range of values considered acceptable. Detectors with data outside of the range “fail” the test and the detector is considered “failed” if the situation persists for several polls. Information for the detector will not be reported and carried through the Mobility Technologies archiving process until the detector exits the “failed” state. Similarly, Mobility Technologies performs data quality tests on its detectors and marks as invalid instances of persistent high occupancy rates. These issues will need to be examined further. Nevertheless, using this data in the prescribed methodology would still provide a conservative estimate of incident frequency in these corridors.

[18] The 5-minute summary data are developed by aggregating information polled from the detectors every 20 seconds.

6 Other Sources of Congestion Information

This section identifies some additional sources of local and national roadway congestion information, and describes some recent reports on the topic.

Chicago area real-time traffic conditions

The website operated by the GCM ITS Priority Corridor partners (www.gcmtravel.com) includes a good deal of information on real-time traffic conditions for selected highways in northeastern Illinois, northwestern Indiana and southeastern Wisconsin. This site is operated through a partnership between the transportation departments of Illinois, Indiana and Wisconsin and the information is available to the general public. The Gateway Traveler Information System, which collects dynamic and static transportation data from agencies in the GCM corridor, makes it possible for the general public to access this traffic data through the internet.

For the IDOT-maintained portion of the northeastern Illinois network, measurements taken by detectors imbedded in the roadway are used to calculate the current travel times for pre-defined highway corridors and provide an estimate of the severity of congestion encountered. The results reported on the website represent a 5-minute summary of detector data. Additionally, data are available for individual loop detector locations in northeastern Illinois including travel speed at that location, the number of vehicles passing over the loop detector and the occupancy rate of the detector. Travel times and congested conditions for the Illinois Tollway system are calculated using plaza-to-plaza travel time information recorded by ISTHA's I-Pass automatic toll collection system. Still camera images of traffic conditions for selected locations on the expressway and tollway systems can also be viewed.

Historical Travel Times Analysis

The GCM partners have provided some flexible tools on the website to allow individuals to perform some historical travel time analyses. This information may be accessed either by linking from the main website or going directly to www.gcmtravelstats.com. By selecting one of the pre-defined corridors from a drop-down list, an individual can see a chart plotting the average travel times during the day for the corridor. The plot also includes the normal range of travel times experienced during the day, as well as the travel time for the current day. The data analyzed can be limited to specific days of the week or include all days.

By clicking on the "Custom Query" link, one is able to directly compare the historical travel times of two separate corridors or compare the travel times during two different time periods for the same corridor. Again the analyst may choose which days of the week to include in the analysis. One also has the ability to define the time period being analyzed, either by selecting a specific month or by specifying a range of dates.

Operations Report

For those interested in performing their own analyses using the travel time data, an Operations Report tool is available at www.gcmtravelstats.com/opsreport.aspx. This page of the website contains all of the functions available under "Custom Query" but it also includes detailed information on the average travel times for each 5-minute period of the day for both corridors. This detailed travel time information can be exported directly into a spreadsheet for further analysis. Individuals can choose from among different travel speed thresholds which are used to color-code the detailed travel time information.

Urban Congestion Report

The Urban Congestion Report (UCR) is an FHWA-sponsored study that automatically collects travel conditions from traveler information websites for a number of urban areas. The data are archived at five minute intervals and are used to analyze overall congestion in each urban area on a monthly basis. The percent of congested travel, the Buffer Index and the Travel Time Index for each city are reported. While the UCR allows one to quickly see the change in monthly congestion in an area, the tool is not intended to compare the congestion among urban areas. Information on weather conditions, incidents and construction activity are also collected if available.

ITIP Monthly Performance Report

Similar to the UCR, monthly performance reports are generated for the cities involved in ITIP. The archived data are used to analyze VMT and several congestion measures each month. A three-month trend is reported and is compared to data from the prior year to establish a longer term trend.

Urban Mobility Report

This report is produced annually by researchers at the Texas Transportation Institute (TTI) at Texas A&M University and its findings are widely reported by the news media. The study examines peak period travel in metropolitan areas (85 in the 2005 edition) and ranks the cities according to several criteria, including the Travel Time Index, average delay per peak period traveler and annual hours of travel delay. The primary source of information for the report is the FHWA's HPMS database, with supplemental data collected from state and local agencies.

Information gleaned from the roadway segments in the HPMS database includes average daily traffic (ADT), the number of driving lanes and the length of the roadway segment. Daily VMT for each segment is calculated using ADT and segment length, and 50% of it is assumed to occur during the peak periods of the day (defined as 6:00-9:30 AM and 3:30-7:00 PM). Using a separate index, an estimate is made of how much of the 50% of daily VMT assumed to be in the peak is operating in congested conditions.

Based on the daily volume per travel lane, each roadway link in the analysis is assigned to one of five congestion categories. Traffic is then split into peak and off-peak travel directions. The directional VMT is summed within each of the congestion categories, and divided by lane miles to determine average traffic per lane. Based on the travel direction and congestion category, equations are used to estimate the link travel speed by direction. An average speed is calculated based on weighting speed from each congestion category by the VMT in the category.

Once average speed is calculated, it allows for the estimation of travel delay compared to freeflow travel speed (assumed to be 60 miles per hour (mph) on freeway links and 35 mph on arterial links). In addition to delay, the report also estimates excess fuel consumed due to delay and the cost of traffic congestion to each urban area. The study researchers are currently refining their research methods and will not release a 2006 edition of the report.

Mobility Monitoring Program

This program is another FHWA-sponsored study that researchers at TTI participate in. It uses archived detector data to analyze congestion and travel reliability in metropolitan areas (29 cities were examined in the 2003 edition). A number of overall congestion and travel reliability measures are calculated for each metropolitan area including reliability throughout the weekdays and vehicle delay during different times of the day. Also, the Travel Time Index and Buffer Index are calculated for individual freeway corridors during different times of the day. The Chicago area has not been included in the study as of the most recent version of this report (2003 edition).

2004 Bottleneck study

In 2004 the American Highway User's Alliance published "Unclogging America's Arteries: Effective Relief for Highway Bottlenecks – 1999-2004". This study identifies the 24 worst highway bottlenecks in the country based on annual delay. This is a follow-up to a 1999 study, and has the objectives of identifying the worst bottlenecks in the country and estimating the benefits of removing the bottlenecks. Three Chicago area bottlenecks are included in the list:

Rank	Interstate	Location
3	I-90	I-90/94 at I-290 (Circle interchange)
11	I-94	I-94 Dan Ryan at I-90 Skyway split
19	I-290	between exits 17b and 23a (Mannheim and Austin)

The list of top bottlenecks was developed from nominations made by representatives of state departments of transportation, and may be partially based on current highway improvement programs. A cutoff value of 10 million annual hours of delay was used to determine the worst bottle necks in the country. A secondary set of other bottlenecks was identified through an analysis of HPMS data. Benefits of the bottleneck improvements are estimated in terms of reduction in delay, reduction in vehicle emissions, motor fuel savings and reduction in vehicle collisions.

2005 Freight Bottleneck study

In October 2005 "An Initial Assessment of Freight Bottlenecks on Highways", a report prepared for the FHWA, was published. This is a preliminary effort to identify and quantify highway freight bottlenecks. It builds on the work of the 2004 bottleneck study, as well as the FHWA's Freight Analysis Framework (FAF), which estimated commodity flows and freight transportation activity between areas, and estimated truck freight flows on the National Highway System.

Bottlenecks were put into four categories based on the physical constraint (interchange, steep grade, signalize intersection or dropped lane) and were further divided based on the type of road they occurred on and the type of freight routes (urban, intercity, etc.) they encompass. Bottlenecks were identified by estimating the volume-to-capacity ratio for each highway link using data from the HPMS. Truck volume estimates from the FAF were used to identify truck volumes for the interchange bottlenecks and a queuing model was used to determine truck hours of delay. A number of bottlenecks in the Chicago region were identified under the various categories of bottlenecks.

APPENDIX A

Corridor Performance Measures

The following pages include some additional measures to help describe traffic operations in the corridors analyzed:

VMT and VHT shares – Average daily corridor VMT and VHT were calculated for each 5-minute period of the day. These amounts were divided by the daily total for the corridor to determine the percentage of VMT and VHT that occurred in each 5-minute time slice of the day. These two measures are plotted on the same graph to show the daily profile of each for the corridor.

Vehicle Hours of Travel – Corridors on the IDOT system include a graph showing the average amount of VHT experienced in the corridor during each of the 5-minute periods. A second line shows the amount of VHT that would be experienced if those vehicles were allowed to travel at freeflow speed (i.e. the posted speed limit), representing the "ideal" conditions. The difference between the average and ideal VHT reflects delay experienced in the corridor, and is shown as the purple-shaded area in the graphs.

Delay is calculated when the average VHT for a five-minute time period is larger than the corresponding ideal VHT. Delay is set to zero in instances where traffic exceeds the speed limit for a 5-minute period, so there is no net benefit calculated for vehicles exceeding the speed limit. Average daily vehicle-hours of delay per 1,000 vehicle miles traveled are shown for each corridor. This is calculated using total daily delay and total VMT in the corridor. This measure can be used as a basis for comparison in future analyses to compare whether or not delay in the corridor is getting worse.

Travel Rate – Tollway corridors include a graph showing the average travel rate in the corridor for each 5-minute period. The travel rate is defined as how many minutes it takes to travel one mile. This measure can be used as a basis for comparison in future analyses to compare whether or not travel in the corridor is slower.

The analysis procedures used to process the detector data for the corridors described in this report are summarized at the end of this appendix.

Caveat

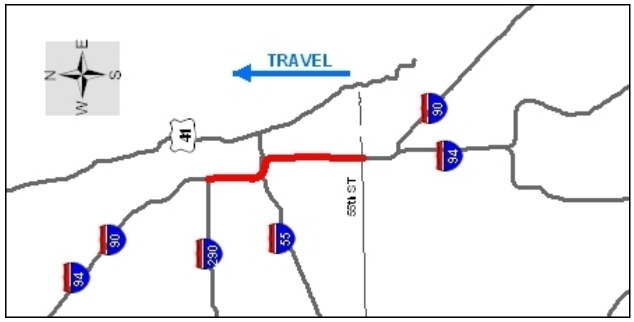
Different delay measures (travel rate vs. delay per 1,000 VMT) are shown for the IDOT and Tollway corridors to discourage direct comparisons of the data between the two systems. The IDOT data are collected using inductance loop detectors imbedded in the pavement which are spaced 0.47 miles apart, on average, in the four corridors analyzed. The MT detectors use either radar or acoustic technology to capture vehicle counts and speed using detectors positioned on poles by the roadside. The Mobility Technologies detectors are spaced much farther apart than the IDOT detectors: 1.43 miles on average for the corridors analyzed. Analyses for both sets of corridors rely on extrapolating spot speeds over longer distances to develop corridor travel times.

#1a. I-90/94 Dan Ryan Express Lanes

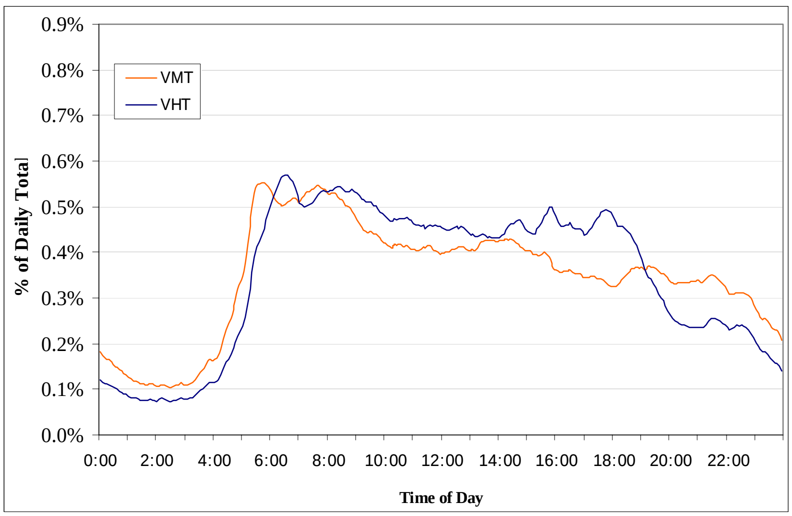
55th Street to Circle Interchange

6.0 miles

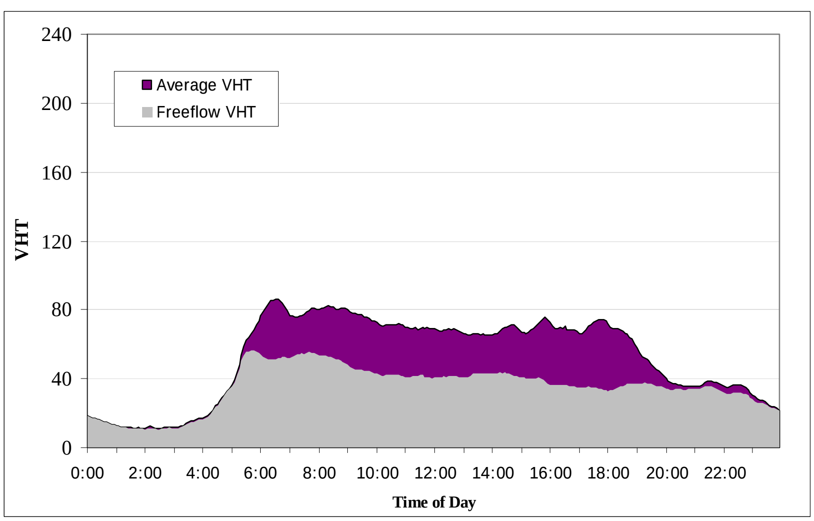
Northbound traffic



Vehicle Miles and Vehicle Hours Shares



Vehicle Hours of Travel



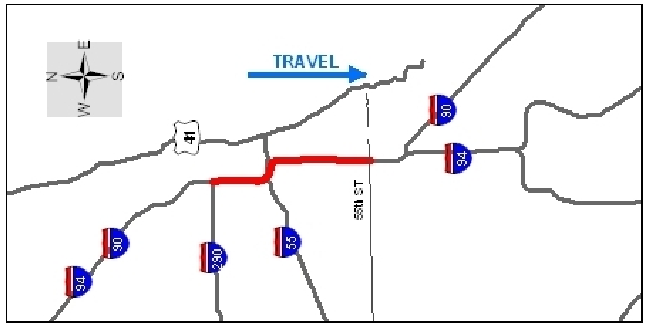
Average Daily Delay: 8.9 vehicle hours of delay per 1,000 VMT

#1b. I-90/94 Dan Ryan Express Lanes

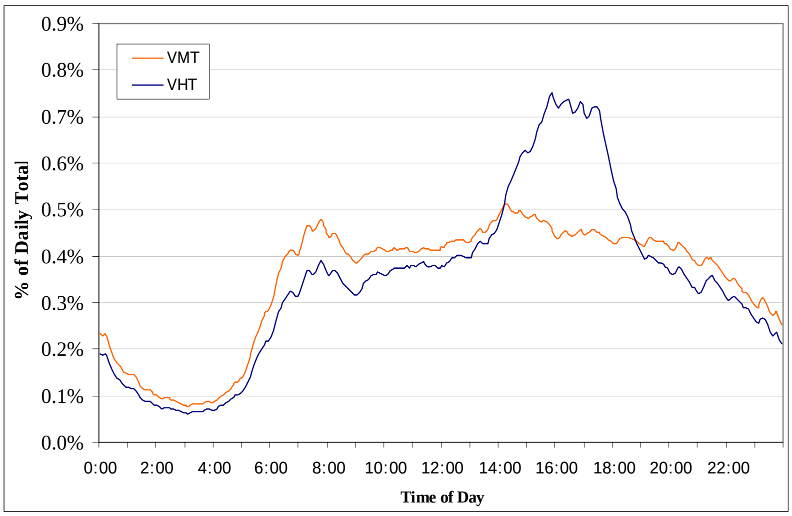
Circle Interchange to 55th Street

6.0 miles

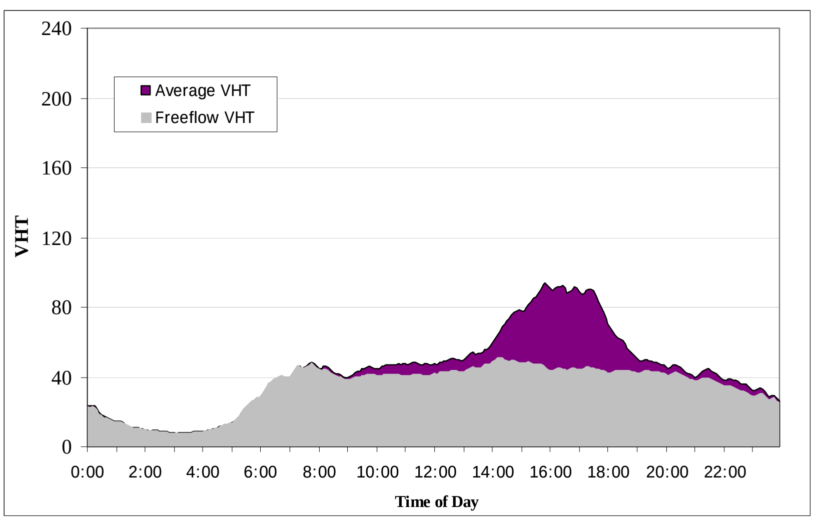
Southbound traffic



Vehicle Miles and Vehicle Hours Shares



Vehicle Hours of Travel



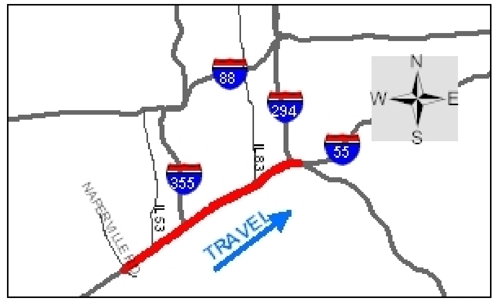
Average Daily Delay: 4.5 vehicle hours of delay per 1,000 VMT

#2a. I-55 Stevenson Expressway

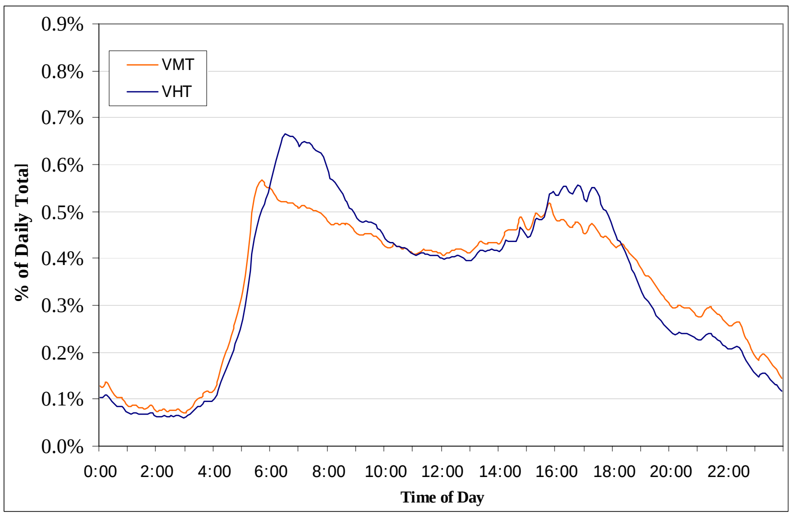
Naperville Road to I-294

12.7 miles

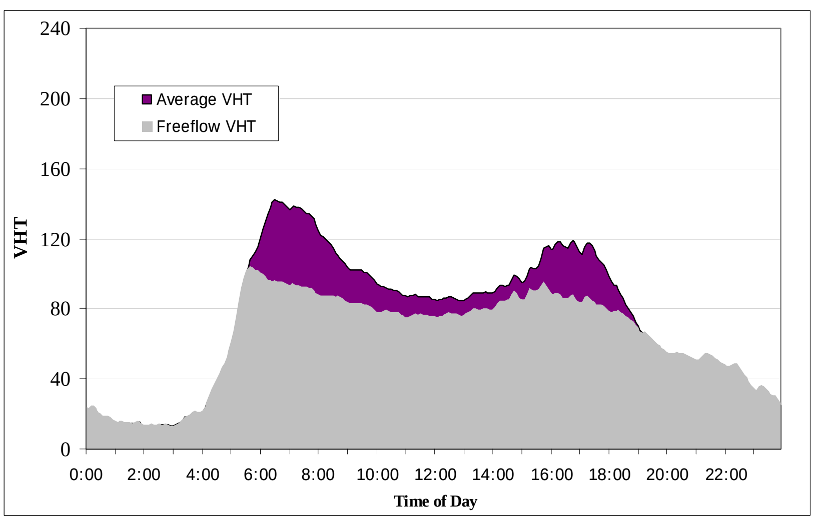
Northbound traffic



Vehicle Miles and Vehicle Hours Shares



Vehicle Hours of Travel



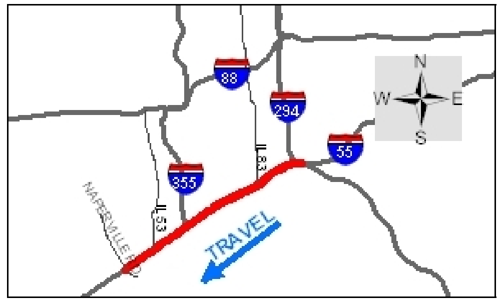
Average Daily Delay: 3.1 vehicle hours of delay per 1,000 VMT

#2b. I-55 Stevenson Expressway

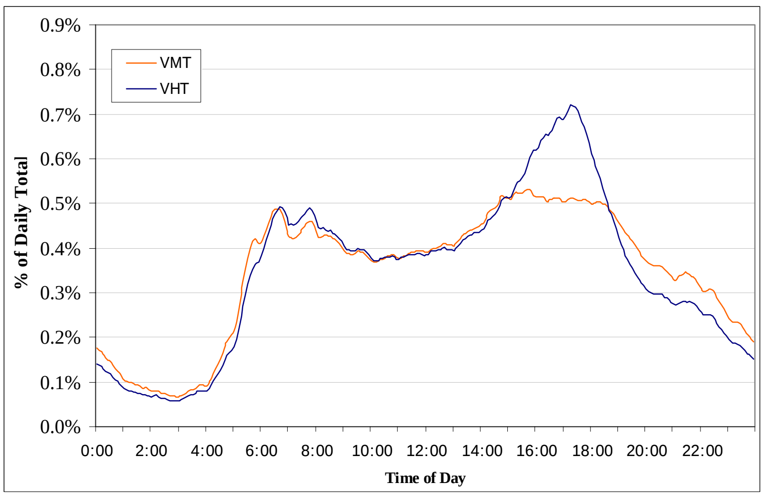
I-294 to Naperville Road

12.7 miles

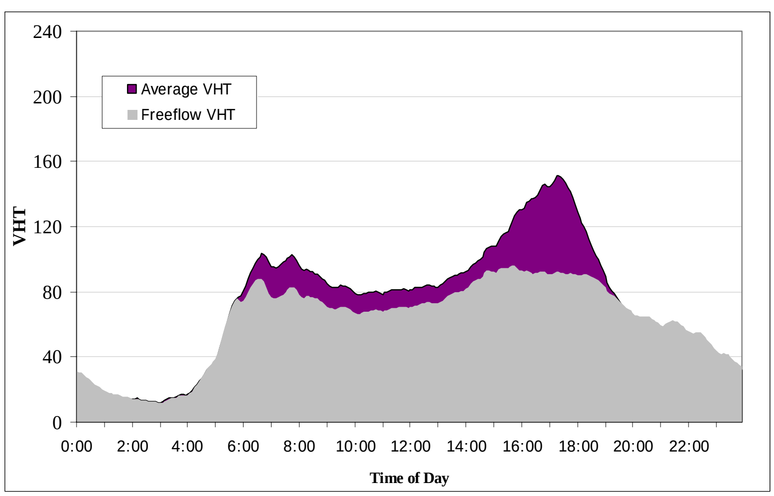
Southbound traffic



Vehicle Miles and Vehicle Hours Shares



Vehicle Hours of Travel



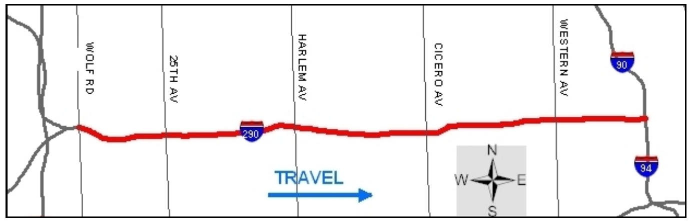
Average Daily Delay: 3.2 vehicle hours of delay per 1,000 VMT

#3a. I-290 Eisenhower Expressway

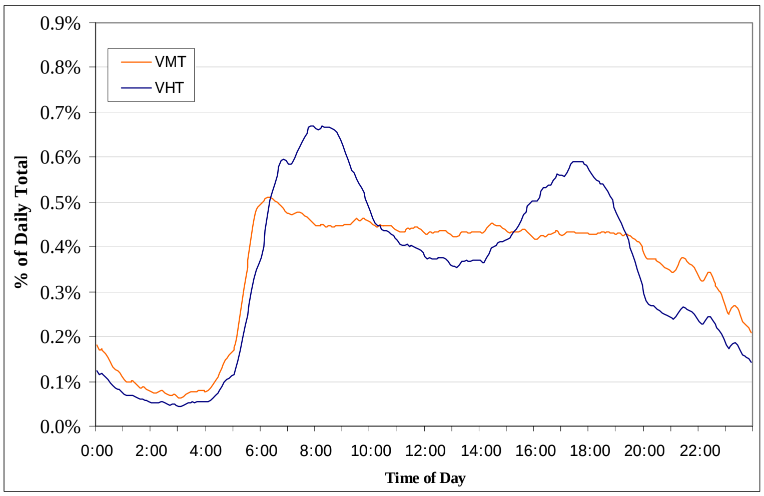
Wolf Road to Circle Interchange

13.4 miles

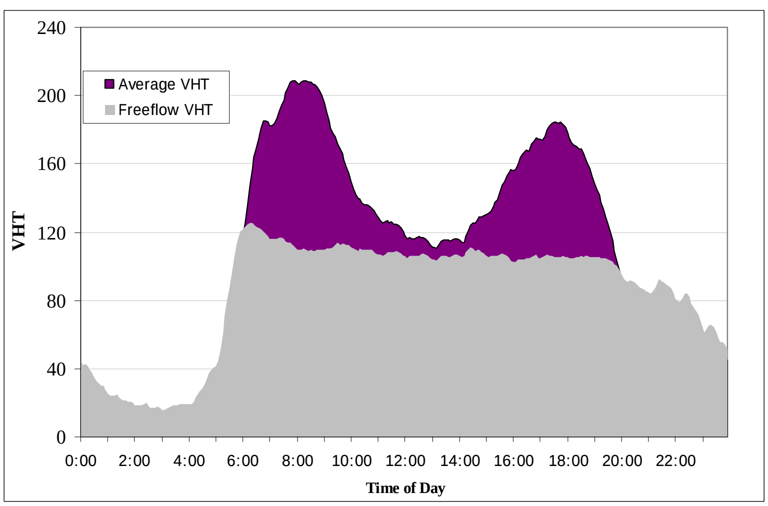
Eastbound traffic



Vehicle Miles and Vehicle Hours Shares



Vehicle Hours of Travel



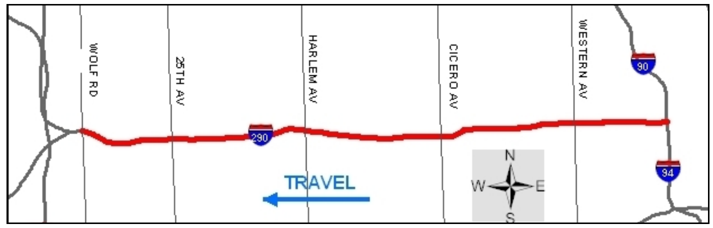
Average Daily Delay: 5.5 vehicle hours of delay per 1,000 VMT

#3b. I-290 Eisenhower Expressway

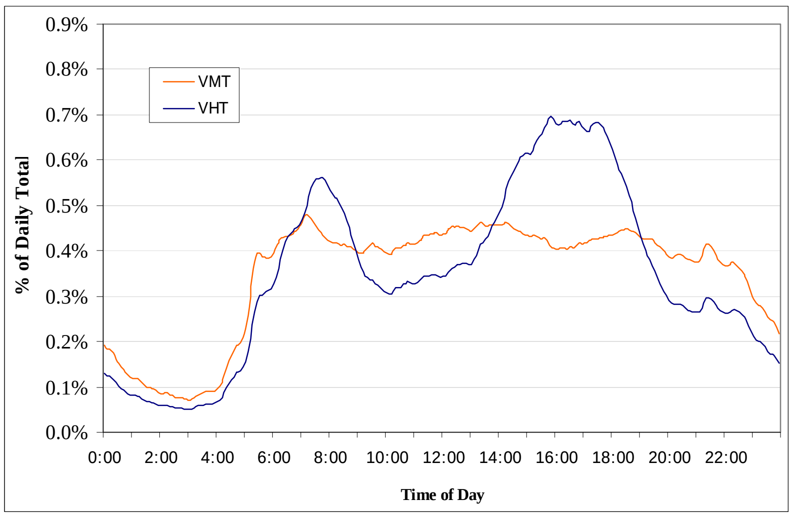
Circle Interchange to Wolf Road

13.4 miles

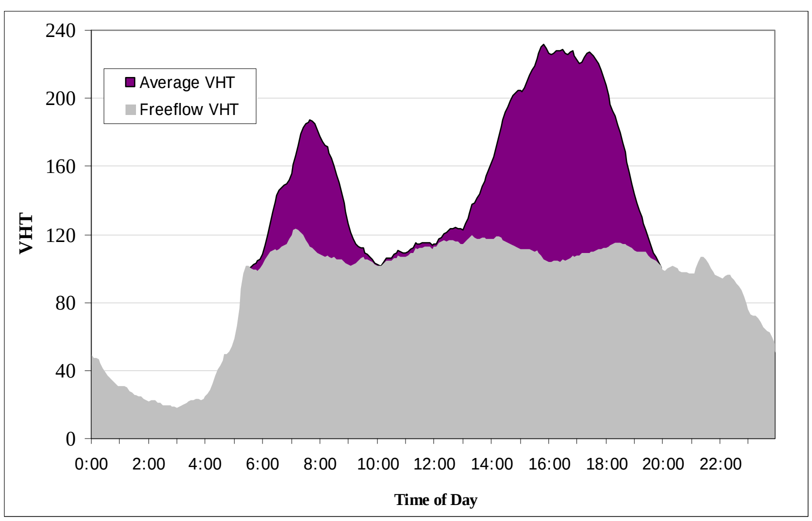
Westbound traffic



Vehicle Miles and Vehicle Hours Shares



Vehicle Hours of Travel



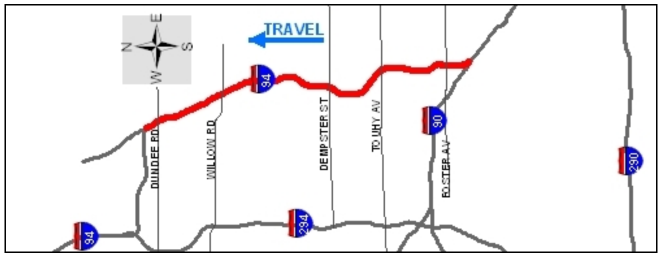
Average Daily Delay: 5.7 vehicle hours of delay per 1,000 VMT

#4a. I-94 Edens Expressway

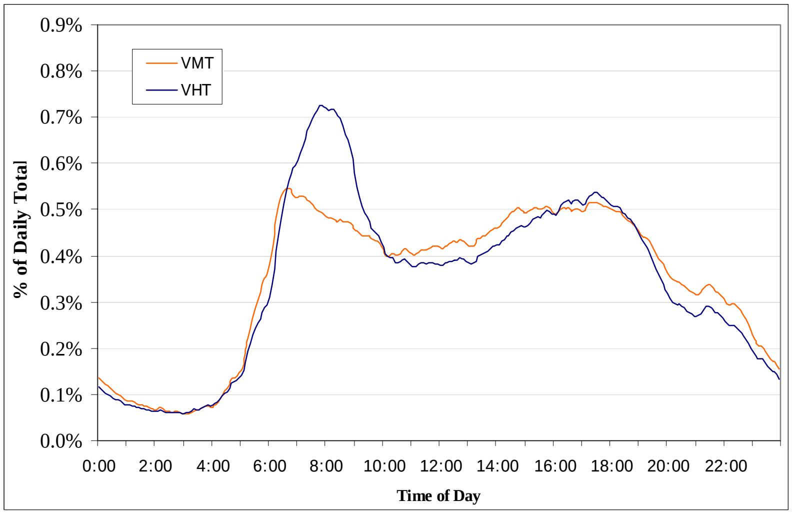
Junction to Edens Spur

13.4 miles

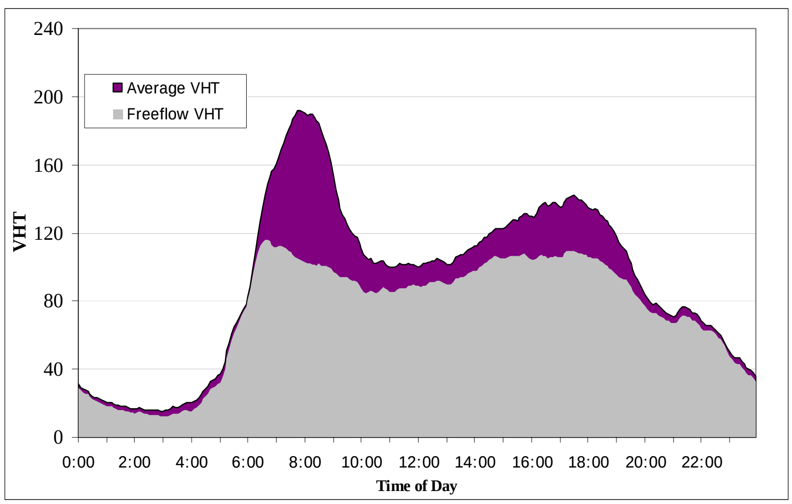
Northbound traffic



Vehicle Miles and Vehicle Hours Shares



Vehicle Hours of Travel



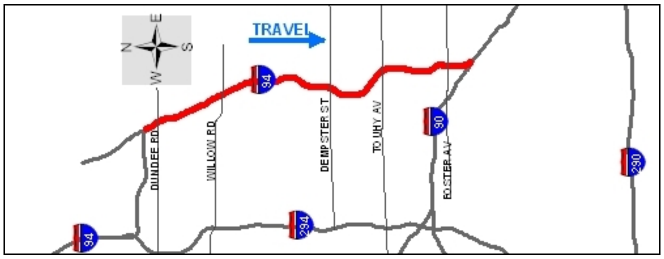
Average Daily Delay: 4.5 vehicle hours of delay per 1,000 VMT

#4b. I-94 Edens Expressway

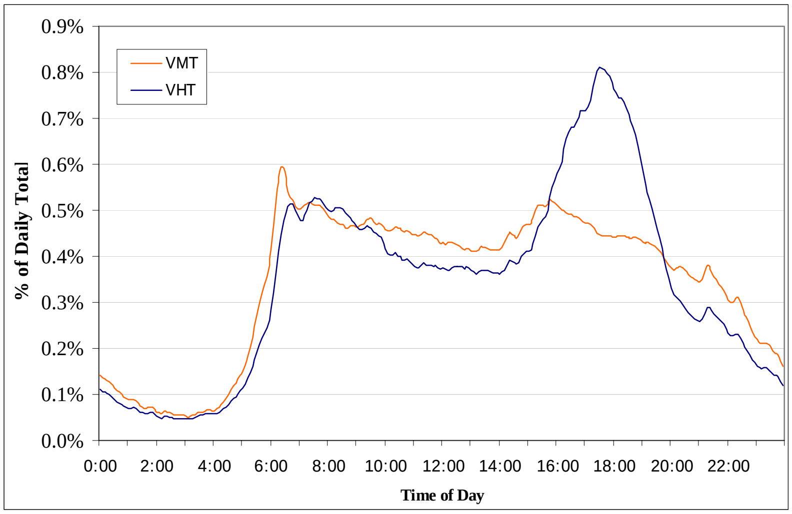
Edens Spur to Junction

13.4 miles

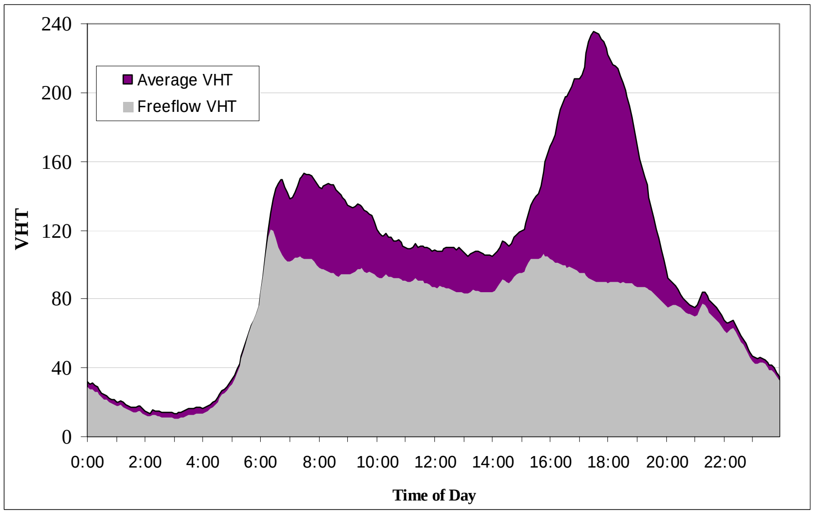
Southbound traffic



Vehicle Miles and Vehicle Hours Shares



Vehicle Hours of Travel



Average Daily Delay: 7.9 vehicle hours of delay per 1,000 VMT

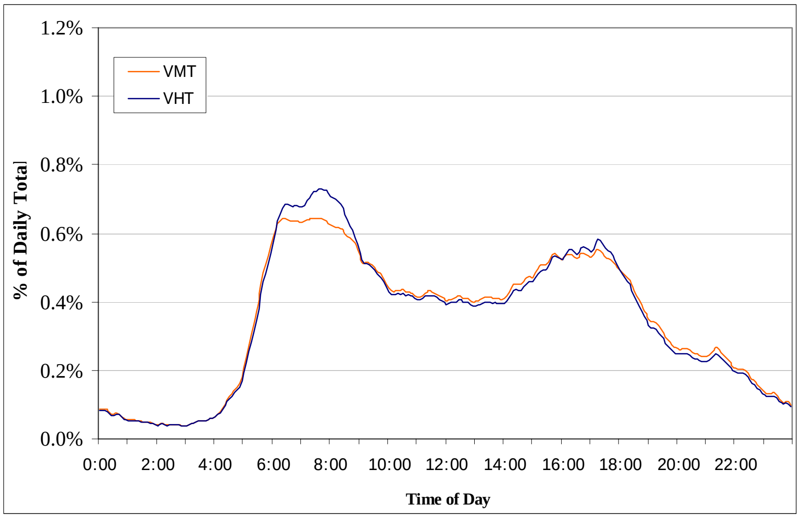
#5a. I-88 Ronald Reagan Memorial Tollway

Naperville Road to IL 83

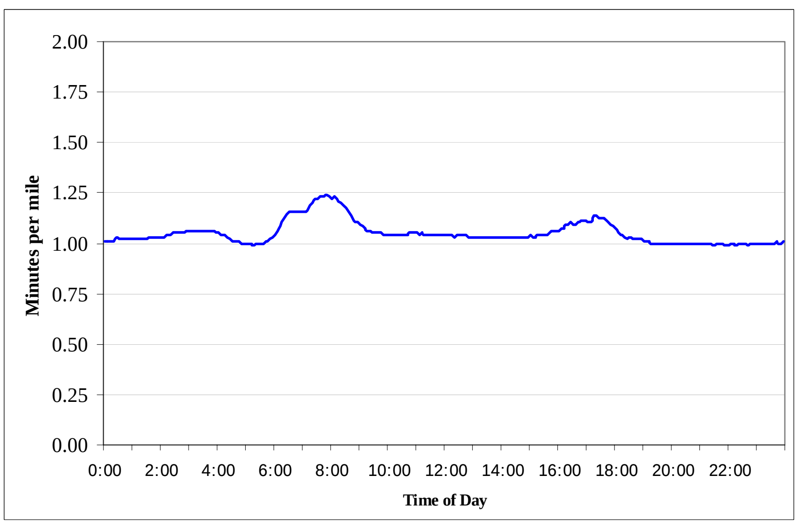
9.5 miles

Eastbound traffic

Vehicle Miles and Vehicle Hours Shares



Travel Rate



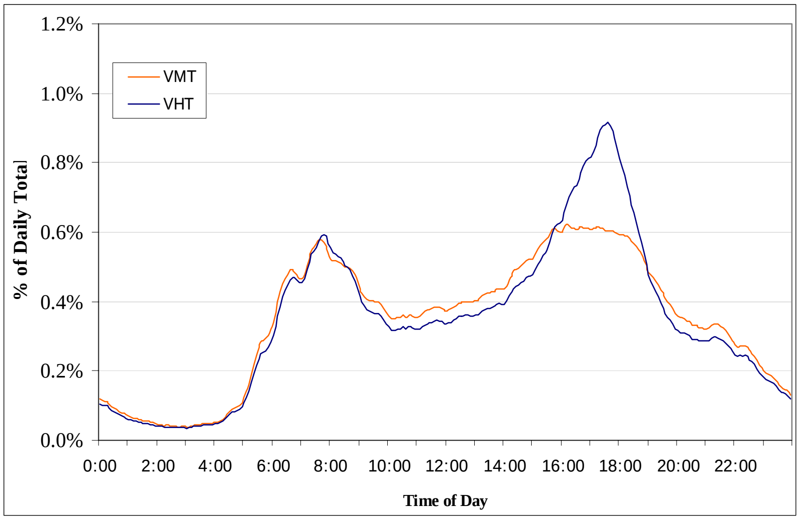
#5b. I-88 Ronald Reagan Memorial Tollway

IL 83 to Naperville Road

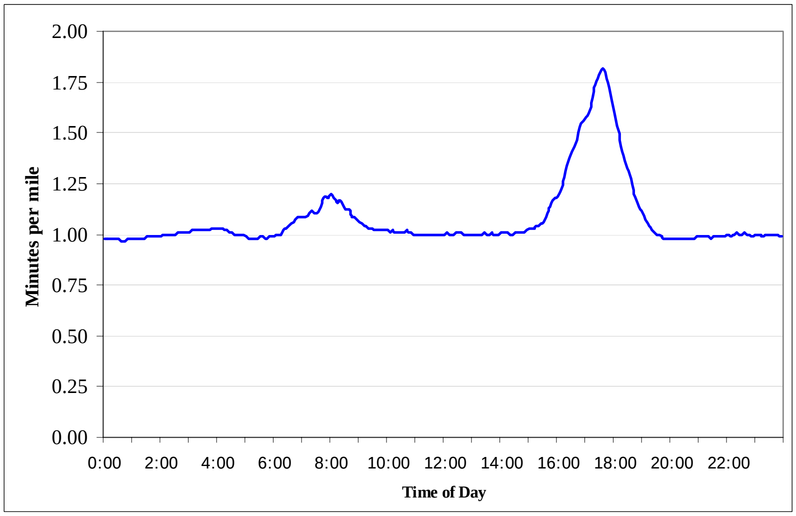
9.5 miles

Westbound traffic

Vehicle Miles and Vehicle Hours Shares



Travel Rate

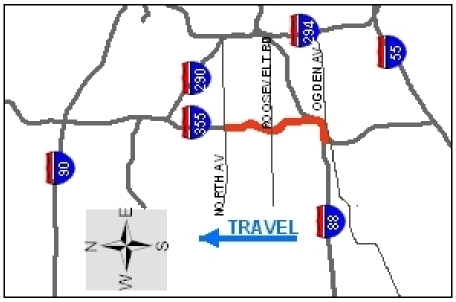


#6a. I-355 North-South Tollway

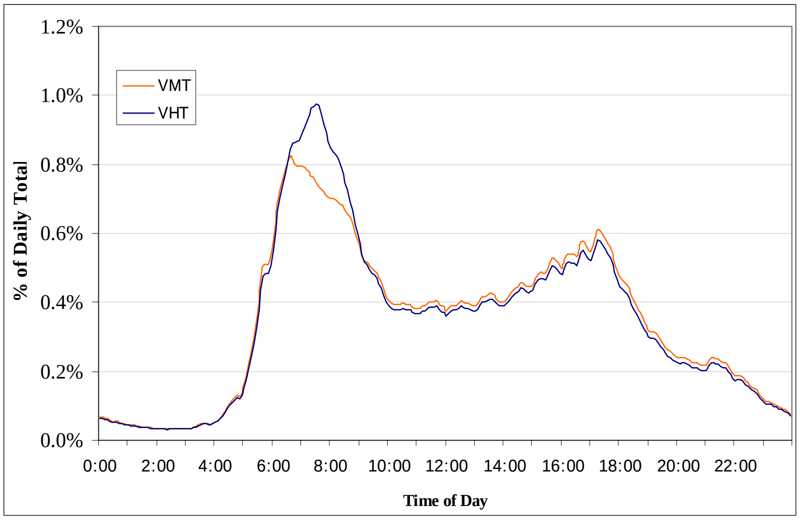
US 34 to IL 64

8.3 miles

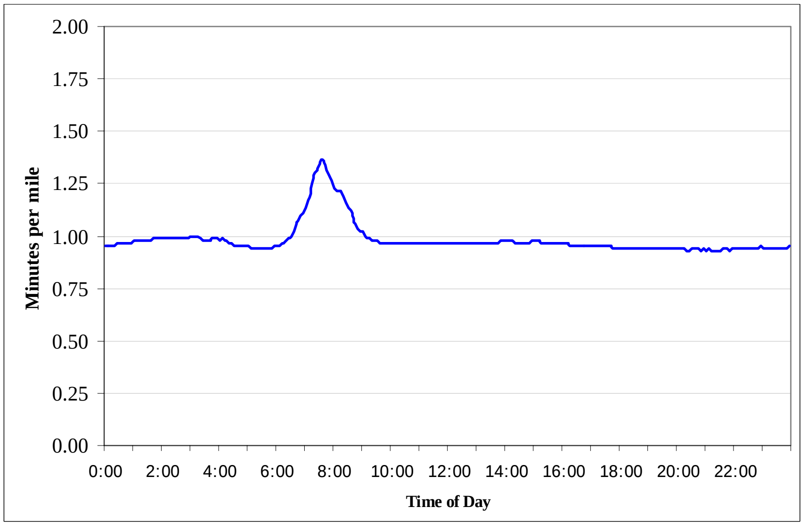
Northbound traffic



Vehicle Miles and Vehicle Hours Shares



Travel Rate

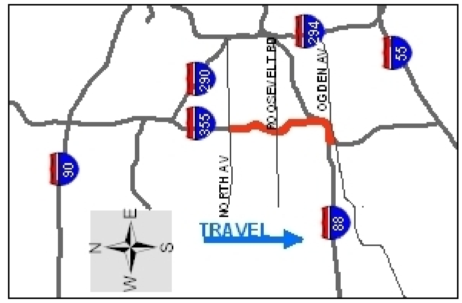


#6b. I-355 North-South Tollway

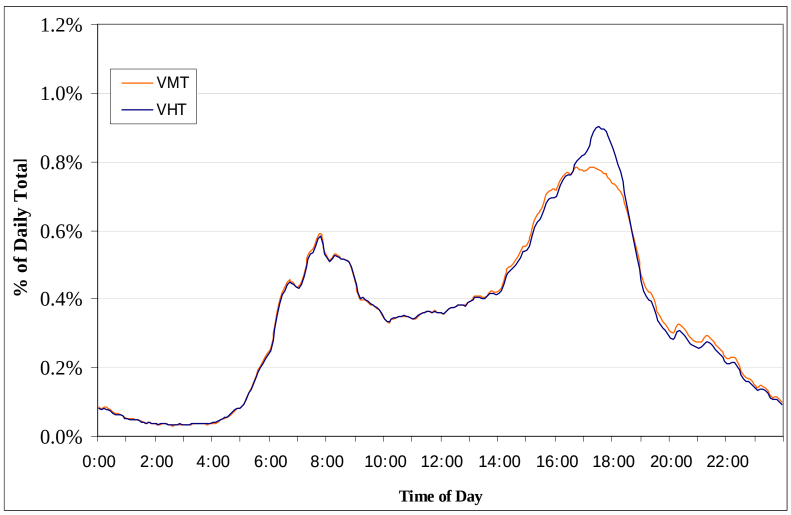
IL 64 to US 34

8.3 miles

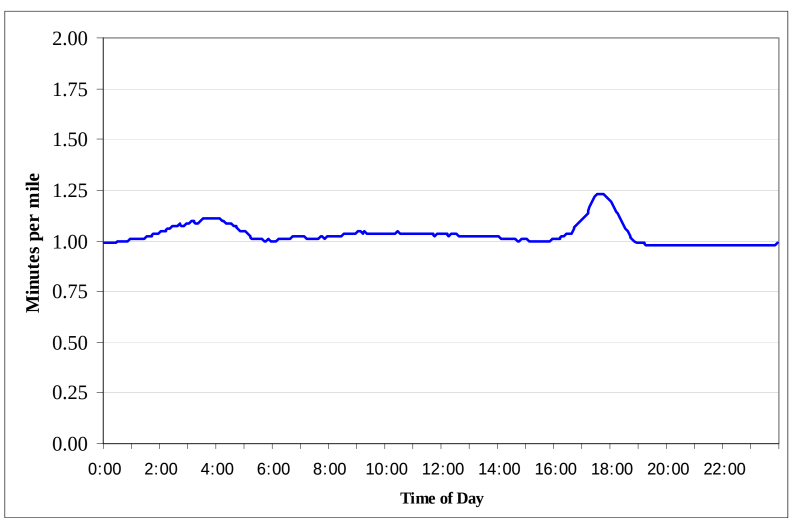
Southbound traffic



Vehicle Miles and Vehicle Hours Shares



Travel Rate

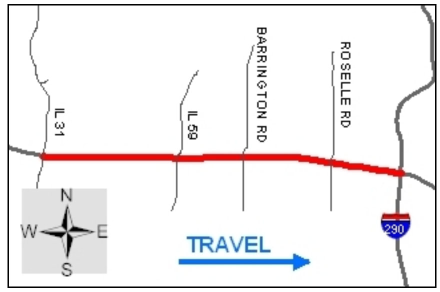


#7a. I-90 Northwest Tollway

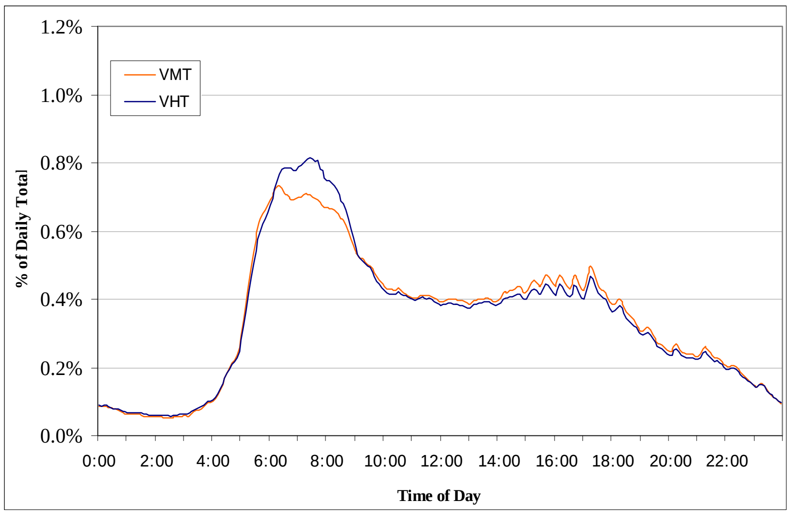
IL 31 to I-290/IL 53

13.6 miles

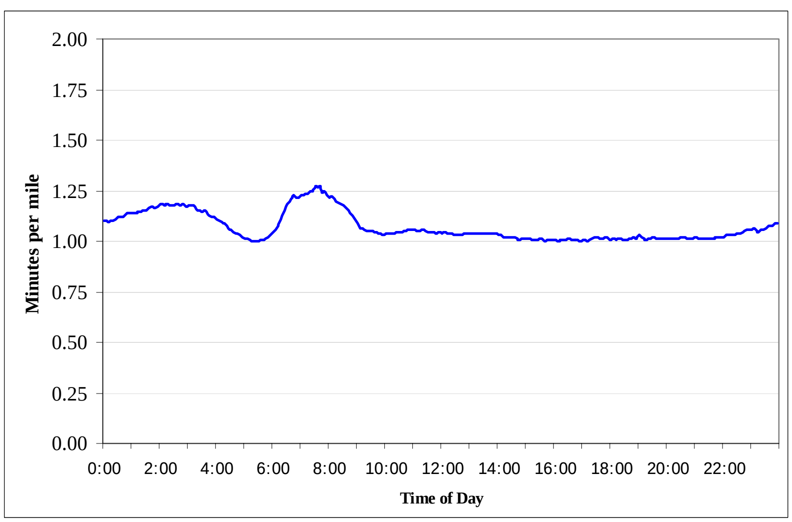
Eastbound traffic



Vehicle Miles and Vehicle Hours Shares



Travel Rate

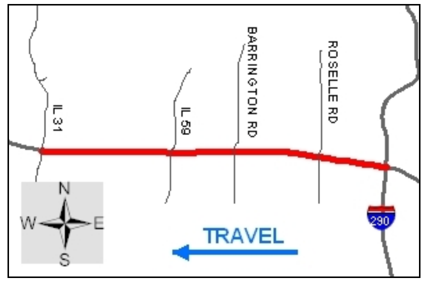


#7b. I-90 Northwest Tollway

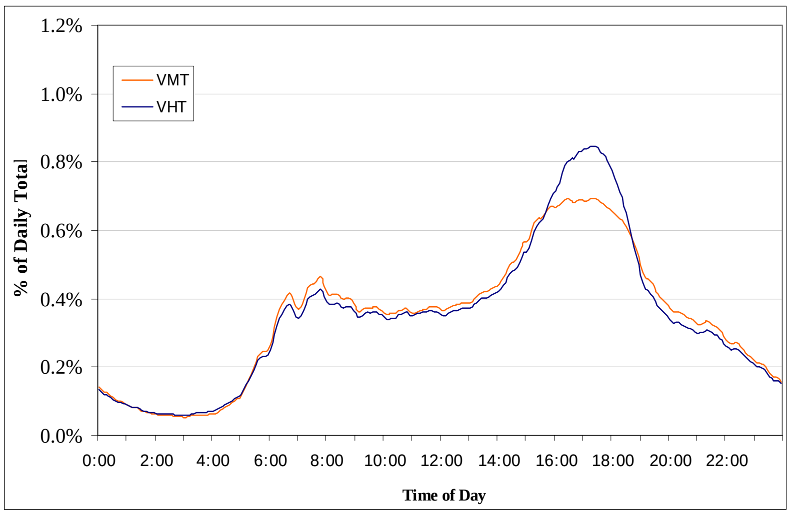
I-290/IL 53 to IL 31

13.6 miles

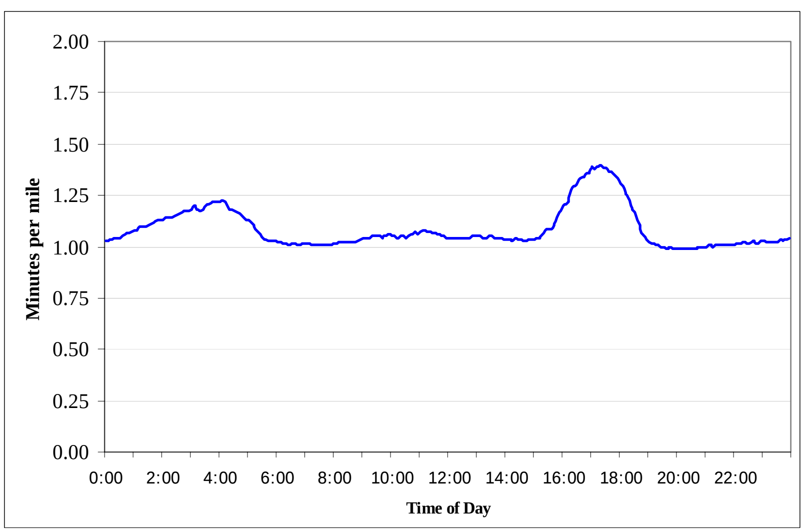
Westbound traffic



Vehicle Miles and Vehicle Hours Shares



Travel Rate

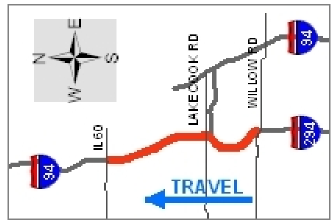


#8a. I-94/294 Tri-State Tollway

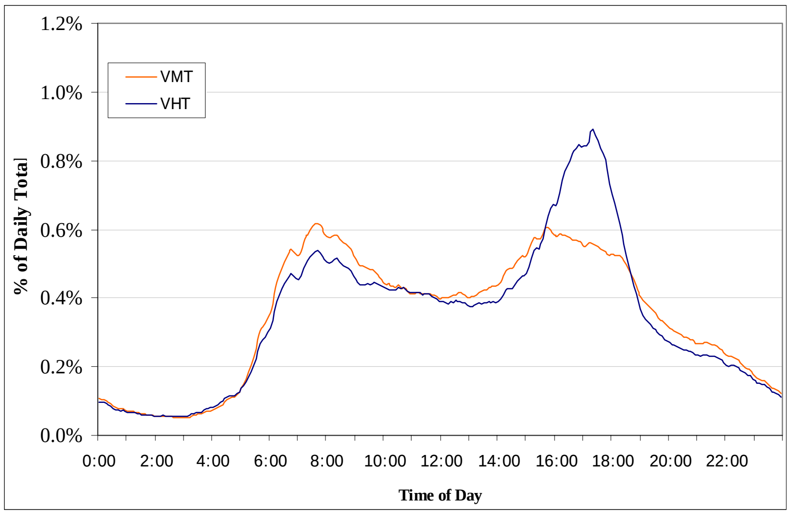
Willow Road to IL 60

10.0 miles

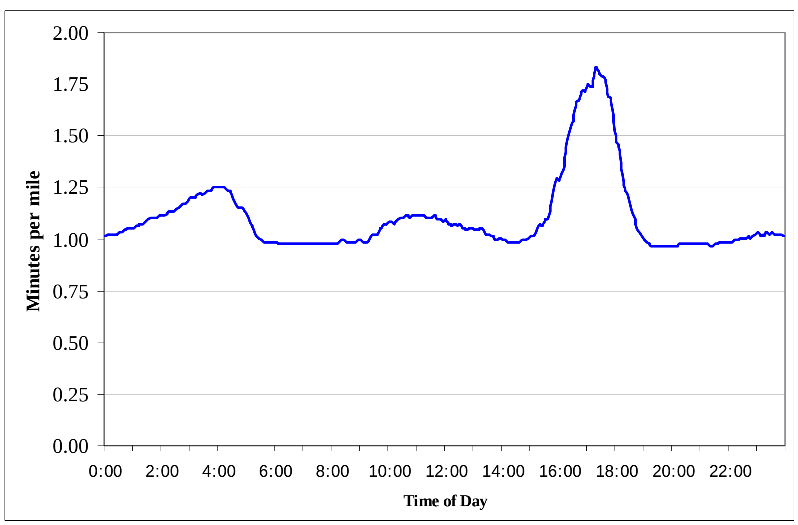
Northbound traffic



Vehicle Miles and Vehicle Hours Shares



Travel Rate

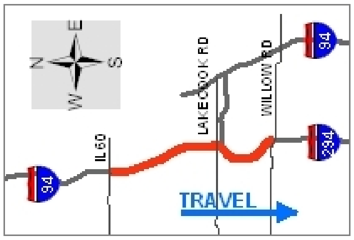


#8b. I-94/294 Tri-State Tollway

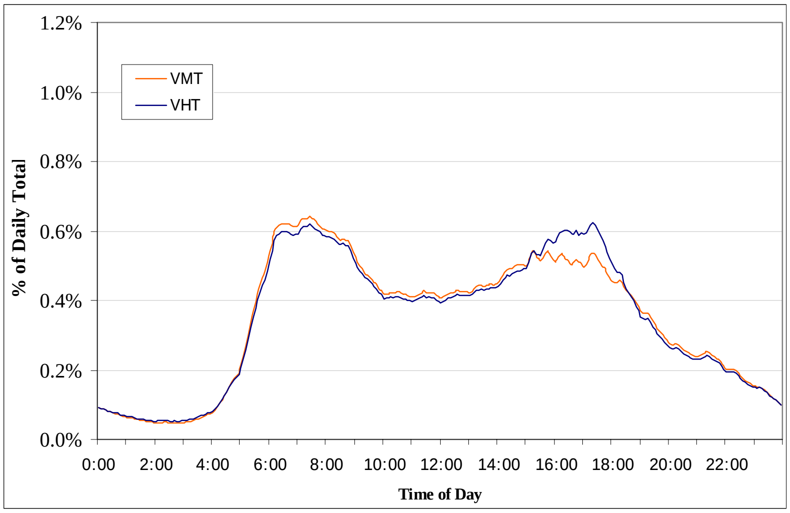
IL 60 to Willow Road

10.0 miles

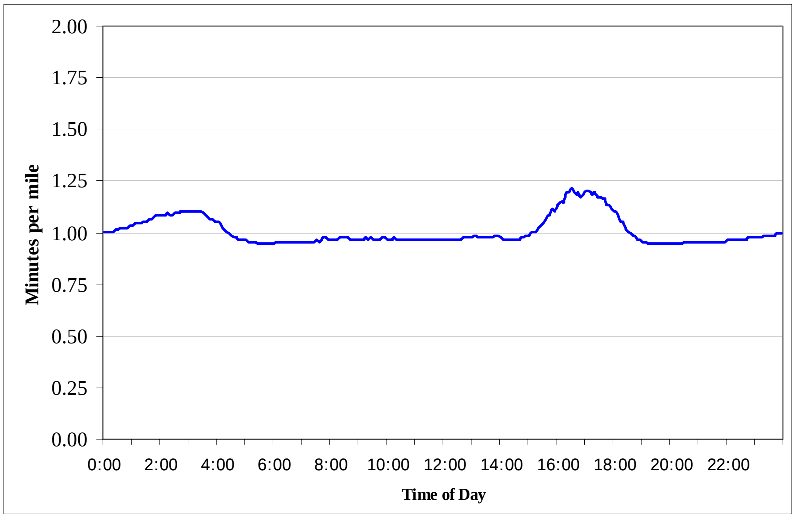
Southbound traffic



Vehicle Miles and Vehicle Hours Shares



Travel Rate



IDOT Corridor Analysis Procedures

One year's worth (July 2004 – June 2005) of daily files containing 5-minute summary data for IDOT detectors were downloaded from Mobility Technologies' website. These data files included all IDOT detectors and covered all days of the month. Data from the individual daily files were combined and stored in monthly SAS datasets. A control file defining each corridor by direction and including the pieces of information needed for processing (the specific detectors, the order of the detectors, distances between the detectors, etc.) was created.

The following steps were used to process data from the monthly datasets and create a corridor dataset:

- Monthly data were first limited to Tuesdays, Wednesdays and Thursdays. Holidays falling on those days of the week were then removed from the dataset based on State of Illinois and national holidays, and days that might logically have lower-than-normal traffic volumes. The actual holidays removed were 11-2-04 (Election Day), 11-11-04 (Veteran's Day), 11-25-04 (Thanksgiving Day), and 12-28-04 through 12-30-04 (the week between Christmas and New Years). Finally the dataset was pared down to detectors in the specific corridor.
- Detector speed and volume were set to missing when the validity of the reading was questionable. Speed was set to missing if any of the validity counts (included in file) for speed, volume or occupancy were zero, or if speed was less than 1. Volume was set to missing if the volume validity count or volume were zero. Non-missing speeds were set to a floor of 3 and a ceiling of 65 (the same procedure used for the GCM Gateway site).
- Detectors were assembled into corridors and missing values for speed and volume were interpolated within 5-minute periods for each day. To avoid interpolating missing detector information using bad data, each 5-minute period per day was flagged if 40% or more of the detectors in the corridor were not reporting or if the corridor had at least 2 consecutive miles of non-reporting detectors. For corridors with fewer than 20 detectors, the cutoff was 50% or more non-reporting detectors, or 2 miles. Five minute time periods flagged by these criteria were dropped from the analysis so no interpolation would be done. The processed detector data were stored in a SAS corridor dataset.

The final steps analyzed the data in the corridor dataset.

- Corridor segments were constructed for each detector. Each segment ran in both directions from the detector and ended at the distance midpoint of the next closest detector. Speed and volume information from each detector was applied to its segment to calculate travel time, VMT, VHT and freeflow VHT for every 5-minute period.
- The segments were combined for each 5-minute period per day to determine corridor values for total travel time, VMT, VHT and freeflow VHT.
- An average daily profile of the corridor for the year was developed by calculating the mean travel time, VMT, VHT and freeflow VHT for each 5-minute period of the days contained in the corridor dataset.

ISTHA Corridor Analysis Procedures

The data for the tollway system, collected from Mobility Technologies detectors, were processed similarly to the IDOT data. The main difference was that the tollway data included a finer level of detail than the IDOT data: information was provided for individual lanes. Again 5-minute summary files were collected for July 2004 – June 2005 and were stored in monthly data files. Two control files were created: one describing the corridors and one describing the lanes for each detector (lane number, travel directions and lane type).

The following steps were used to process data from the monthly datasets and create a corridor dataset:

- Ramps were eliminated from the analysis; only through lanes were used. Monthly data were limited to Tuesdays, Wednesdays and Thursdays, and the same holidays as before were used to exclude data. Finally the dataset was pared down to detectors in the specific corridor.
- Lane speeds were set to missing if any of the validity counts for speed, volume or occupancy were zero, or if speed was less than 1. Lane volume was set to missing if the volume validity count or volume were zero. Speed and volume data for individual lanes were then combined to create directional information for a detector. Lane volumes were summed and a directional detector speed was determined using lane speeds weighted by a composite index (lane volume × valid lane volume count × valid lane speed count). Non-missing detector speeds were then set to a floor of 3 and a ceiling of 65.
- Detectors were assembled into corridors and missing values for speed and volume were interpolated using the same procedures as for the IDOT data. The processed detector data were stored in a SAS corridor dataset.

The final steps analyzed the data in the corridor dataset.

- A second index was created when lane data were combined into directional detector data in the previous step. This corridor weight was calculated as follows: valid lane volume count × number of records received ÷ number of directional lanes covered by detector. This was calculated for each lane and created a detector weight for each 5-minute period once the lane values were summed.
- Speed and volume information from each detector was used to calculate corridor travel time, VMT, VHT and freeflow VHT for every 5-minute period of the day. A corridor weight was also calculated for each 5-minute period by summing the detector weights.
- An average daily profile of the corridor for the year was developed by calculating the mean travel time, VMT, VHT and freeflow VHT for each 5-minute period of the days contained in the corridor dataset weighted by the corridor weight. This reduced the influence of occasions when a full 5-minute summary of data was not obtained by detectors.

APPENDIX B

Modeled Data

Table B-1. 2005 Arterial Data

1. 8:00 pm - 6:00 am

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	347	0	118,343	0	11,214	0	7,814	0	715	0
02. Chicago balance	2,764	1	1,321,022	2,488	81,673	133	61,380	349	3,703	18
03. Cook Co. balance	5,987	0	3,046,230	824	235,705	30	106,759	269	7,943	10
04. DuPage Co.	2,596	0	1,380,771	151	107,730	6	44,733	52	3,364	2
05. Kane Co.	2,237	0	788,148	0	48,270	0	22,787	0	1,361	0
06. Kendall Co.	949	0	151,592	0	9,829	0	3,859	0	248	0
07. Lake Co.	2,421	5	1,302,875	19,013	114,182	3,233	39,257	1,108	3,373	185
08. McHenry Co.	2,152	0	641,519	0	38,715	0	16,906	0	1,013	0
09. Will Co.	3,571	0	844,565	0	43,513	0	23,239	0	1,168	0
10. Grundy Co. part	101	0	12,950	0	294	0	297	0	7	0
Total	23,125	6	9,608,015	22,476	691,125	3,402	327,031	1,778	22,895	215

2. 6:00 am - 7:00 am

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	347	11	69,032	9,504	10,208	471	6,455	1,743	764	77
02. Chicago balance	2,764	40	566,490	21,889	92,906	2,213	30,369	2,516	4,766	248
03. Cook Co. balance	5,987	62	1,142,965	39,891	200,254	3,634	45,556	3,114	7,519	266
04. DuPage Co.	2,596	25	508,141	16,257	83,095	1,526	19,096	1,271	2,885	114
05. Kane Co.	2,237	9	266,635	5,945	37,112	351	8,356	364	1,108	22
06. Kendall Co.	949	2	54,390	892	9,206	41	1,531	59	244	3
07. Lake Co.	2,421	99	495,500	64,709	85,498	6,959	19,249	4,520	2,946	476
08. McHenry Co.	2,152	9	234,988	4,010	29,346	286	6,907	410	824	32
09. Will Co.	3,571	6	289,247	3,701	37,052	279	8,392	288	1,043	22
10. Grundy Co. part	101	0	3,539	0	234	0	83	0	5	0
Total	23,125	263	3,630,927	166,798	584,911	15,760	145,994	14,285	22,104	1,260

3. 7:00 am - 9:00 am

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	347	75	265,767	124,687	68,652	20,124	52,461	39,336	9,327	5,406
02. Chicago balance	2,764	725	2,134,038	906,060	648,212	215,667	207,536	136,211	57,058	32,482
03. Cook Co. balance	5,987	969	4,064,049	1,303,715	1,315,746	297,357	260,138	140,608	72,809	30,098
04. DuPage Co.	2,596	407	1,764,438	563,824	512,750	104,146	104,426	56,165	25,445	9,933
05. Kane Co.	2,237	90	976,998	111,394	249,891	16,102	38,496	9,878	8,798	1,398
06. Kendall Co.	949	27	245,023	33,800	77,084	5,638	8,646	2,554	2,506	461
07. Lake Co.	2,421	538	1,701,245	804,854	522,354	162,023	123,336	90,016	30,090	17,784
08. McHenry Co.	2,152	105	841,093	138,438	190,493	18,602	31,912	11,429	6,454	1,544
09. Will Co.	3,571	84	1,084,858	102,738	268,316	16,300	38,001	7,988	8,785	1,275
10. Grundy Co. part	101	0	13,800	0	1,699	0	334	0	41	0
Total	23,125	3,020	13,091,309	4,089,510	3,855,197	855,959	865,286	494,185	221,313	100,381

4. 9:00 am - 10:00 am

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	347	6	57,690	2,349	37,181	1,600	4,692	359	2,879	236
02. Chicago balance	2,764	135	615,002	51,074	335,215	26,332	36,579	6,374	20,724	3,991
03. Cook Co. balance	5,987	174	1,353,600	84,652	678,463	35,509	59,027	7,712	28,704	2,915
04. DuPage Co.	2,596	55	589,539	25,619	270,150	10,876	23,359	2,080	10,409	877
05. Kane Co.	2,237	20	328,933	9,712	125,029	2,526	10,804	593	3,935	164
06. Kendall Co.	949	3	71,345	1,430	34,673	404	2,056	95	984	27
07. Lake Co.	2,421	168	543,846	75,569	288,454	42,626	22,348	6,021	12,557	4,183
08. McHenry Co.	2,152	12	268,681	5,154	99,361	1,534	8,063	508	2,929	151
09. Will Co.	3,571	15	372,687	7,223	130,561	1,972	11,286	565	3,852	156
10. Grundy Co. part	101	0	5,377	0	848	0	127	0	20	0
Total	23,125	588	4,206,700	262,782	1,999,935	123,379	178,341	24,307	86,993	12,700

Table B-1. 2005 Arterial Data (continued)

5. 10:00 am - 2:00 pm

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	347	4	275,945	8,188	105,423	2,529	22,941	1,752	8,001	451
02. Chicago balance	2,764	110	2,808,777	184,748	954,195	64,623	163,743	23,674	56,171	8,346
03. Cook Co. balance	5,987	175	6,446,408	406,179	1,972,021	99,018	280,317	37,722	83,184	8,408
04. DuPage Co.	2,596	59	2,837,428	124,864	801,635	32,194	113,036	10,634	31,124	2,672
05. Kane Co.	2,237	22	1,549,182	45,307	375,415	7,808	51,389	3,057	11,937	549
06. Kendall Co.	949	2	317,365	2,823	103,698	606	9,125	162	2,949	33
07. Lake Co.	2,421	118	2,462,495	229,539	862,781	99,179	95,635	17,962	35,632	9,485
08. McHenry Co.	2,152	12	1,230,000	20,332	299,448	4,242	36,928	2,101	8,871	460
09. Will Co.	3,571	17	1,721,804	35,157	385,614	6,353	52,616	2,733	11,463	496
10. Grundy Co. part	101	0	26,125	0	2,584	0	615	0	61	0
Total	23,125	519	19,675,529	1,057,137	5,862,814	316,552	826,345	99,797	249,393	30,900

6. 2:00 pm - 4:00 pm

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	347	13	169,007	13,400	64,037	5,035	14,838	2,100	5,227	667
02. Chicago balance	2,764	243	1,633,998	237,147	582,434	77,935	107,969	31,479	38,427	10,564
03. Cook Co. balance	5,987	313	3,643,254	361,543	1,154,036	101,241	172,559	36,109	52,634	9,113
04. DuPage Co.	2,596	125	1,583,050	143,331	451,901	37,434	67,599	11,950	18,598	2,947
05. Kane Co.	2,237	39	871,849	40,167	216,493	7,883	29,892	2,805	7,087	540
06. Kendall Co.	949	9	181,939	10,069	63,246	2,720	5,551	705	1,883	181
07. Lake Co.	2,421	241	1,442,997	271,185	496,934	94,670	63,438	21,667	22,575	8,583
08. McHenry Co.	2,152	25	700,243	25,360	172,367	5,671	22,013	2,344	5,273	508
09. Will Co.	3,571	23	957,283	26,247	223,715	4,742	30,086	2,182	6,838	406
10. Grundy Co. part	101	0	14,386	0	1,526	0	339	0	36	0
Total	23,125	1,031	11,198,006	1,128,449	3,426,689	337,331	514,284	111,341	158,578	33,509

7. 4:00 pm - 6:00 pm

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	347	53	281,619	87,865	26,860	6,504	39,060	21,416	3,015	1,359
02. Chicago balance	2,764	458	2,314,938	612,901	233,074	51,563	181,551	84,710	17,049	6,902
03. Cook Co. balance	5,987	631	4,886,136	949,472	462,196	68,622	270,981	104,972	23,249	6,980
04. DuPage Co.	2,596	277	2,139,962	410,974	181,028	26,149	108,759	40,167	8,303	2,427
05. Kane Co.	2,237	89	1,193,597	117,512	90,184	6,249	45,047	9,546	3,139	483
06. Kendall Co.	949	20	259,703	27,205	27,945	2,178	8,676	2,074	878	157
07. Lake Co.	2,421	406	2,019,534	647,331	198,186	47,948	111,061	61,755	9,824	4,683
08. McHenry Co.	2,152	75	973,498	108,318	72,427	5,306	34,354	8,998	2,351	443
09. Will Co.	3,571	49	1,272,837	68,142	90,558	3,324	42,681	5,901	2,895	293
10. Grundy Co. part	101	0	19,238	0	637	0	458	0	15	0
Total	23,125	2,058	15,361,062	3,029,720	1,383,095	217,843	842,628	339,539	70,718	23,727

8. 6:00 pm - 8:00 pm

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	347	4	149,067	5,586	4,674	65	11,841	1,130	331	13
02. Chicago balance	2,764	46	1,467,587	51,942	36,760	941	78,037	6,704	1,869	114
03. Cook Co. balance	5,987	36	3,181,505	52,747	89,110	540	123,889	5,820	3,288	61
04. DuPage Co.	2,596	13	1,408,184	14,355	38,750	233	50,787	1,502	1,327	25
05. Kane Co.	2,237	6	815,419	6,705	17,452	62	25,541	495	525	5
06. Kendall Co.	949	2	172,406	1,356	4,640	8	4,751	91	124	1
07. Lake Co.	2,421	24	1,317,412	37,008	40,861	1,568	44,746	3,143	1,369	139
08. McHenry Co.	2,152	8	657,649	7,796	14,065	136	18,907	778	396	14
09. Will Co.	3,571	12	897,905	16,025	16,874	201	26,625	1,136	482	15
10. Grundy Co. part	101	0	14,080	0	120	0	332	0	3	0
Total	23,125	151	10,081,214	193,520	263,306	3,754	385,456	20,799	9,714	387

Table B-2. 2005 Expressway Data

1. 8:00 pm - 6:00 am

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	93	0	338,114	0	33,032	0	8,646	0	833	0
02. Chicago balance	546	0	1,502,672	0	170,559	0	32,063	0	3,634	0
03. Cook Co. balance	1,005	0	1,302,747	0	274,793	0	25,043	0	5,227	0
04. DuPage Co.	428	0	408,351	0	104,921	0	7,813	0	1,998	0
05. Kane Co.	171	0	143,767	0	18,367	0	2,417	0	309	0
06. Kendall Co.	12	0	8,985	0	1,285	0	141	0	20	0
07. Lake Co.	208	0	322,394	0	40,064	0	6,099	0	758	0
08. McHenry Co.	55	0	41,717	0	6,889	0	676	0	110	0
09. Will Co.	320	0	325,370	0	52,403	0	5,304	0	853	0
10. Grundy Co. part	10	0	6,659	0	1,001	0	104	0	16	0
Total	2,848	0	4,400,776	0	703,314	0	88,306	0	13,758	0

2. 6:00 am - 7:00 am

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	93	7	95,357	12,449	15,849	1,802	3,869	1,099	621	156
02. Chicago balance	559	35	561,614	62,792	84,795	6,493	21,586	6,966	2,820	698
03. Cook Co. balance	1,005	8	634,835	14,110	182,280	1,557	14,358	788	3,890	88
04. DuPage Co.	428	0	213,638	0	70,955	0	4,544	0	1,448	0
05. Kane Co.	171	0	61,000	0	11,976	0	1,075	0	210	0
06. Kendall Co.	12	0	1,889	0	811	0	30	0	13	0
07. Lake Co.	208	0	137,058	0	27,312	0	3,262	0	604	0
08. McHenry Co.	55	0	14,002	0	3,871	0	233	0	64	0
09. Will Co.	320	0	140,607	0	33,831	0	2,410	0	575	0
10. Grundy Co. part	10	0	4,074	0	631	0	66	0	10	0
Total	2,861	50	1,864,074	89,351	432,311	9,852	51,433	8,853	10,255	942

3. 7:00 am - 9:00 am

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	93	33	217,487	106,597	55,991	25,525	18,463	14,658	4,263	3,248
02. Chicago balance	559	170	1,320,053	594,435	345,116	110,011	113,095	88,702	23,388	16,306
03. Cook Co. balance	1,005	81	1,627,010	220,595	873,984	77,314	58,221	17,104	27,624	5,646
04. DuPage Co.	428	19	585,365	58,908	383,930	16,920	19,616	4,917	10,949	1,337
05. Kane Co.	171	0	183,435	0	61,499	0	3,730	0	1,247	0
06. Kendall Co.	12	0	5,846	0	3,980	0	96	0	65	0
07. Lake Co.	208	31	374,037	101,991	124,078	22,647	18,271	11,470	4,933	2,520
08. McHenry Co.	55	0	44,149	0	21,338	0	764	0	367	0
09. Will Co.	320	4	429,295	10,242	188,074	3,303	9,490	532	3,994	171
10. Grundy Co. part	10	0	12,691	0	3,372	0	218	0	58	0
Total	2,861	338	4,799,368	1,092,768	2,061,362	255,720	241,964	137,383	76,888	29,228

4. 9:00 am - 10:00 am

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	93	9	71,670	6,685	42,834	8,182	2,678	420	1,965	520
02. Chicago balance	559	25	375,853	20,918	252,460	22,233	12,788	2,877	9,132	2,368
03. Cook Co. balance	1,005	7	421,345	5,600	531,322	5,282	10,196	341	12,740	323
04. DuPage Co.	428	0	151,124	0	219,954	0	3,398	0	4,934	0
05. Kane Co.	171	0	58,147	0	36,733	0	1,045	0	670	0
06. Kendall Co.	12	0	2,486	0	2,574	0	41	0	43	0
07. Lake Co.	208	0	119,687	0	78,470	0	3,013	0	1,937	0
08. McHenry Co.	55	0	16,334	0	12,064	0	282	0	207	0
09. Will Co.	320	0	120,969	0	103,700	0	2,184	0	1,866	0
10. Grundy Co. part	10	0	3,381	0	2,054	0	57	0	34	0
Total	2,861	41	1,340,996	33,203	1,282,165	35,697	35,682	3,638	33,528	3,211

Table B-2. 2005 Expressway Data (continued)

5. 10:00 am - 2:00 pm

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	93	6	316,970	23,447	147,863	19,720	12,020	1,644	6,616	1,395
02. Chicago balance	546	18	1,497,888	80,970	843,724	54,448	56,937	19,689	30,961	8,571
03. Cook Co. balance	1,005	0	1,910,866	0	1,716,426	0	43,598	0	39,240	0
04. DuPage Co.	428	0	706,878	0	697,616	0	15,377	0	15,146	0
05. Kane Co.	171	0	259,373	0	112,694	0	4,619	0	2,033	0
06. Kendall Co.	12	0	12,616	0	7,677	0	207	0	126	0
07. Lake Co.	208	0	540,372	0	246,852	0	12,074	0	5,545	0
08. McHenry Co.	55	0	75,480	0	36,572	0	1,296	0	623	0
09. Will Co.	320	0	555,363	0	325,200	0	9,845	0	5,750	0
10. Grundy Co. part	10	0	13,467	0	6,430	0	223	0	106	0
Total	2,848	24	5,889,273	104,417	4,141,054	74,168	156,196	21,333	106,146	9,966

6. 2:00 pm - 4:00 pm

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	95	20	205,798	47,663	74,450	20,587	9,755	3,456	3,745	1,338
02. Chicago balance	557	44	1,016,954	115,734	425,737	56,351	86,277	60,045	27,282	16,318
03. Cook Co. balance	1,005	16	1,250,303	40,059	916,425	19,717	31,840	2,944	22,752	1,441
04. DuPage Co.	428	3	464,464	8,584	387,960	3,059	10,914	475	8,936	169
05. Kane Co.	171	0	158,261	0	63,426	0	2,884	0	1,172	0
06. Kendall Co.	12	0	7,296	0	3,795	0	120	0	63	0
07. Lake Co.	208	0	325,529	0	128,336	0	8,439	0	3,265	0
08. McHenry Co.	55	0	44,908	0	20,337	0	777	0	350	0
09. Will Co.	320	0	341,254	0	179,642	0	6,281	0	3,291	0
10. Grundy Co. part	10	0	7,042	0	3,495	0	117	0	58	0
Total	2,861	83	3,821,809	212,040	2,203,603	99,714	157,404	66,920	70,914	19,266
			1,442,691				113,559			

7. 4:00 pm - 6:00 pm

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	95	38	289,827	142,583	26,957	12,833	25,914	19,999	1,864	1,329
02. Chicago balance	557	86	1,382,615	323,491	167,851	27,151	73,955	40,772	7,582	3,429
03. Cook Co. balance	1,005	21	1,941,451	74,617	397,080	8,779	53,351	6,820	10,171	820
04. DuPage Co.	428	6	719,682	24,156	161,927	2,747	19,012	2,218	3,898	237
05. Kane Co.	171	0	225,047	0	26,245	0	4,317	0	505	0
06. Kendall Co.	12	0	10,000	0	1,496	0	163	0	24	0
07. Lake Co.	208	31	461,556	114,367	53,000	9,625	16,015	8,156	1,637	677
08. McHenry Co.	55	0	58,809	0	8,325	0	1,003	0	141	0
09. Will Co.	320	0	502,530	0	77,444	0	9,629	0	1,459	0
10. Grundy Co. part	10	0	8,390	0	1,438	0	137	0	23	0
Total	2,861	182	5,599,907	679,214	921,763	61,135	203,496	77,965	27,304	6,492

8. 6:00 pm - 8:00 pm

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	95	5	234,749	16,811	9,510	0	8,450	1,465	295	0
02. Chicago balance	557	4	1,033,767	16,162	51,149	546	25,904	1,668	1,221	55
03. Cook Co. balance	1,005	0	1,160,747	0	94,583	0	23,189	0	1,873	0
04. DuPage Co.	428	0	381,153	0	36,738	0	7,519	0	718	0
05. Kane Co.	171	0	144,457	0	6,114	0	2,492	0	106	0
06. Kendall Co.	12	0	8,004	0	410	0	128	0	7	0
07. Lake Co.	208	0	325,668	0	13,754	0	6,526	0	275	0
08. McHenry Co.	55	0	40,253	0	2,004	0	666	0	33	0
09. Will Co.	320	0	307,878	0	17,429	0	5,164	0	292	0
10. Grundy Co. part	10	0	7,047	0	339	0	113	0	5	0
Total	2,861	9	3,643,723	32,973	232,030	546	80,151	3,133	4,825	55

Table B-3. 2030 Arterial Data

1. 8:00 pm - 6:00 am

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	352	1	135,937	3,644	14,020	225	9,123	294	899	18
02. Chicago balance	2,787	1	1,432,590	1,565	92,906	88	66,533	303	4,238	17
03. Cook Co. balance	6,082	0	3,267,961	516	251,943	12	114,054	100	8,498	2
04. DuPage Co.	2,654	0	1,505,045	0	121,294	0	48,662	0	3,794	0
05. Kane Co.	2,310	0	1,217,394	69	67,807	2	34,637	32	1,906	1
06. Kendall Co.	994	0	224,066	0	13,377	0	5,783	0	343	0
07. Lake Co.	2,598	0	1,607,102	0	126,896	0	47,264	0	3,632	0
08. McHenry Co.	2,246	0	888,498	0	49,977	0	23,337	0	1,320	0
09. Will Co.	3,578	0	1,392,027	897	60,817	35	38,209	74	1,654	3
10. Grundy Co. part	101	0	15,865	0	396	0	366	0	9	0
Total	23,702	2	11,686,485	6,691	799,433	362	387,968	803	26,293	41

2. 6:00 am - 7:00 am

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	352	18	82,937	15,397	13,242	1,192	8,385	2,704	1,109	202
02. Chicago balance	2,787	45	600,840	23,917	106,886	2,698	32,129	2,500	5,510	287
03. Cook Co. balance	6,082	54	1,201,916	34,381	215,176	2,796	47,133	2,510	8,042	208
04. DuPage Co.	2,654	25	550,408	15,963	92,787	1,461	20,650	1,261	3,234	107
05. Kane Co.	2,310	27	393,341	18,303	53,352	1,128	12,846	1,212	1,626	73
06. Kendall Co.	994	2	87,741	861	12,035	17	2,537	52	329	1
07. Lake Co.	2,598	132	593,037	89,022	95,190	8,348	23,330	5,851	3,305	549
08. McHenry Co.	2,246	27	328,236	17,340	39,282	1,151	10,107	1,218	1,144	84
09. Will Co.	3,578	12	453,720	6,815	51,146	412	13,498	546	1,482	36
10. Grundy Co. part	101	0	4,520	0	309	0	108	0	7	0
Total	23,702	342	4,296,696	221,999	679,405	19,203	170,723	17,854	25,788	1,547

3. 7:00 am - 9:00 am

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	352	92	304,693	159,026	84,863	27,886	69,407	55,652	13,082	8,322
02. Chicago balance	2,787	803	2,288,649	1,021,901	727,222	260,119	232,896	159,079	67,897	41,178
03. Cook Co. balance	6,082	1,091	4,334,887	1,450,788	1,439,837	343,826	280,793	155,446	81,348	34,986
04. DuPage Co.	2,654	494	1,944,184	679,041	595,420	139,985	121,647	70,274	31,216	13,610
05. Kane Co.	2,310	289	1,434,589	421,440	353,622	60,566	73,362	38,789	14,778	5,103
06. Kendall Co.	994	71	361,842	91,900	100,488	12,935	13,976	5,978	3,388	891
07. Lake Co.	2,598	687	2,026,044	1,069,696	581,796	195,525	152,188	116,042	34,752	21,442
08. McHenry Co.	2,246	209	1,161,789	313,640	255,280	42,439	52,465	27,216	9,917	3,724
09. Will Co.	3,578	209	1,640,566	261,761	339,925	36,272	63,981	20,311	12,253	2,833
10. Grundy Co. part	101	0	18,759	0	2,739	0	478	0	69	0
Total	23,702	3,945	15,516,002	5,469,193	4,481,192	1,119,553	1,061,193	648,787	268,700	132,089

4. 9:00 am - 10:00 am

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	352	11	65,847	3,880	45,856	2,676	5,634	617	3,721	405
02. Chicago balance	2,787	145	670,642	55,301	365,557	27,506	39,959	6,940	23,059	4,677
03. Cook Co. balance	6,082	177	1,446,964	84,548	733,440	34,751	62,796	7,484	30,951	2,797
04. DuPage Co.	2,654	67	645,843	30,719	313,827	12,840	26,289	2,636	12,392	1,095
05. Kane Co.	2,310	74	512,548	41,127	183,131	8,624	18,356	3,073	6,202	636
06. Kendall Co.	994	7	106,481	3,102	48,492	870	3,134	200	1,394	58
07. Lake Co.	2,598	178	649,135	83,024	320,404	45,348	26,654	6,848	14,026	4,570
08. McHenry Co.	2,246	44	376,585	21,708	137,348	6,833	11,750	1,460	4,235	467
09. Will Co.	3,578	43	602,021	20,869	176,147	5,503	19,232	1,646	5,534	415
10. Grundy Co. part	101	0	6,725	0	1,187	0	162	0	28	0
Total	23,702	746	5,082,791	344,278	2,325,389	144,951	213,966	30,904	101,542	15,120

Table B-3. 2030 Arterial Data (continued)

5. 10:00 am - 2:00 pm

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	352	9	317,627	17,089	131,778	6,843	28,540	3,282	10,585	1,016
02. Chicago balance	2,787	126	3,097,955	217,619	1,049,166	72,220	182,015	28,052	62,844	10,063
03. Cook Co. balance	6,082	174	6,900,241	386,958	2,129,502	95,626	298,115	34,950	89,947	7,989
04. DuPage Co.	2,654	80	3,089,677	165,924	914,228	45,443	126,450	14,715	36,532	3,873
05. Kane Co.	2,310	80	2,383,647	184,926	538,788	31,308	84,901	13,239	18,490	2,160
06. Kendall Co.	994	6	453,434	11,952	139,826	2,800	13,376	856	4,028	195
07. Lake Co.	2,598	123	2,951,349	247,444	959,252	105,294	113,096	19,333	38,996	9,570
08. McHenry Co.	2,246	26	1,711,739	49,972	408,366	12,021	52,960	4,230	12,602	983
09. Will Co.	3,578	54	2,797,145	115,974	513,380	17,778	91,331	9,708	16,491	1,478
10. Grundy Co. part	101	0	31,408	0	3,441	0	752	0	82	0
Total	23,702	678	23,734,222	1,397,858	6,787,727	389,333	991,536	128,365	290,597	37,327

6. 2:00 pm - 4:00 pm

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	352	25	197,451	25,547	81,169	10,468	19,124	4,071	7,296	1,491
02. Chicago balance	2,787	268	1,786,077	257,627	644,930	88,939	117,642	33,307	43,353	12,282
03. Cook Co. balance	6,082	360	3,911,006	415,065	1,259,565	113,358	185,150	38,858	57,851	10,038
04. DuPage Co.	2,654	175	1,748,483	201,732	521,464	54,519	78,533	17,828	22,495	4,548
05. Kane Co.	2,310	141	1,333,976	172,621	315,243	28,832	51,286	12,909	11,416	2,092
06. Kendall Co.	994	14	266,131	15,229	84,260	2,956	8,365	1,123	2,540	224
07. Lake Co.	2,598	268	1,718,084	303,596	556,757	103,521	75,473	24,658	25,765	9,730
08. McHenry Co.	2,246	55	981,257	64,692	237,255	13,382	32,683	5,498	7,744	1,147
09. Will Co.	3,578	84	1,541,444	93,967	297,529	16,169	52,696	7,972	9,948	1,304
10. Grundy Co. part	101	0	17,474	0	1,998	0	421	0	48	0
Total	23,702	1,390	13,501,383	1,550,076	4,000,170	432,144	621,373	146,224	188,456	42,856

7. 4:00 pm - 6:00 pm

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	352	72	326,934	124,076	32,917	9,372	52,326	33,763	4,232	2,292
02. Chicago balance	2,787	510	2,499,721	694,502	257,503	61,457	199,558	96,824	19,482	8,427
03. Cook Co. balance	6,082	686	5,196,875	1,034,956	497,561	75,506	285,312	108,492	25,125	7,493
04. DuPage Co.	2,654	353	2,342,372	530,106	205,966	35,915	127,690	55,097	10,068	3,520
05. Kane Co.	2,310	283	1,794,429	444,082	129,689	22,114	83,579	38,257	5,268	1,760
06. Kendall Co.	994	54	381,655	70,977	37,218	3,829	13,928	5,145	1,213	293
07. Lake Co.	2,598	531	2,384,994	867,331	219,707	57,109	134,006	78,532	11,138	5,508
08. McHenry Co.	2,246	165	1,360,512	256,218	98,622	12,206	54,166	21,497	3,564	1,053
09. Will Co.	3,578	200	2,021,784	274,485	116,784	12,396	77,669	22,564	4,255	996
10. Grundy Co. part	101	0	22,792	0	840	0	562	0	21	0
Total	23,702	2,854	18,332,068	4,296,733	1,596,807	289,904	1,028,796	460,171	84,366	31,342

8. 6:00 pm - 8:00 pm

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	352	6	171,676	10,067	5,782	163	14,289	1,831	425	29
02. Chicago balance	2,787	49	1,590,756	53,944	40,228	942	84,657	6,872	2,063	119
03. Cook Co. balance	6,082	47	3,404,843	65,904	94,491	757	132,206	6,254	3,502	71
04. DuPage Co.	2,654	18	1,520,702	23,309	43,088	344	55,182	2,074	1,490	35
05. Kane Co.	2,310	50	1,275,830	70,844	24,560	655	42,762	5,115	777	47
06. Kendall Co.	994	4	250,483	3,382	6,064	25	7,115	222	167	2
07. Lake Co.	2,598	42	1,596,008	56,596	44,512	2,341	54,425	4,174	1,507	171
08. McHenry Co.	2,246	11	917,253	13,987	18,511	158	26,850	1,125	536	14
09. Will Co.	3,578	35	1,472,028	45,723	22,555	469	46,100	3,768	686	40
10. Grundy Co. part	101	0	16,891	0	162	0	404	0	4	0
Total	23,702	262	12,216,470	343,756	299,953	5,854	463,990	31,435	11,157	528

Table B-4. 2030 Expressway Data

1. 8:00 pm - 6:00 am

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	93	0	349,292	0	37,652	0	9,081	0	969	0
02. Chicago balance	598	0	1,604,027	0	203,710	0	33,947	0	4,318	0
03. Cook Co. balance	1,183	0	1,543,317	0	336,061	0	29,588	0	6,393	0
04. DuPage Co.	488	0	544,217	0	137,754	0	10,436	0	2,629	0
05. Kane Co.	171	0	205,571	0	21,877	0	3,521	0	376	0
06. Kendall Co.	12	0	9,829	0	1,498	0	155	0	24	0
07. Lake Co.	349	0	411,162	0	62,832	0	7,696	0	1,176	0
08. McHenry Co.	55	0	44,606	0	5,546	0	723	0	90	0
09. Will Co.	589	0	587,430	0	78,904	0	9,976	0	1,309	0
10. Grundy Co. part	10	0	6,963	0	1,144	0	109	0	18	0
Total	3,548	0	5,306,414	0	886,978	0	105,232	0	17,302	0

2. 6:00 am - 7:00 am

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	93	9	98,133	14,405	17,091	1,925	4,066	1,254	663	161
02. Chicago balance	612	27	616,503	50,143	99,358	3,900	21,485	4,609	2,965	353
03. Cook Co. balance	1,183	3	751,621	5,791	223,227	491	16,750	311	4,727	26
04. DuPage Co.	488	0	276,224	0	92,314	0	5,848	0	1,890	0
05. Kane Co.	171	0	81,306	0	14,513	0	1,502	0	265	0
06. Kendall Co.	12	0	1,996	0	942	0	32	0	15	0
07. Lake Co.	349	0	213,354	0	43,438	0	4,679	0	902	0
08. McHenry Co.	55	0	15,449	0	3,666	0	257	0	61	0
09. Will Co.	589	0	253,999	0	52,914	0	4,571	0	919	0
10. Grundy Co. part	10	0	4,667	0	730	0	77	0	12	0
Total	3,562	39	2,313,252	70,339	548,193	6,316	59,267	6,174	12,419	540

3. 7:00 am - 9:00 am

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	93	33	222,376	107,422	60,596	27,960	21,401	17,228	5,267	4,132
02. Chicago balance	612	208	1,435,288	721,718	418,187	133,913	116,958	93,775	24,126	15,439
03. Cook Co. balance	1,183	127	1,911,516	333,803	1,087,223	138,157	71,895	25,962	36,065	10,082
04. DuPage Co.	488	33	719,722	94,216	465,871	33,892	26,558	7,662	14,556	2,657
05. Kane Co.	171	16	241,823	49,437	67,853	10,956	7,492	3,120	1,907	679
06. Kendall Co.	12	0	6,549	0	4,772	0	108	0	79	0
07. Lake Co.	349	45	621,527	145,903	218,312	30,474	28,710	14,378	8,190	2,979
08. McHenry Co.	55	0	48,950	0	18,624	0	848	0	323	0
09. Will Co.	589	3	754,214	8,846	302,022	2,432	18,289	579	6,763	136
10. Grundy Co. part	10	0	17,082	0	5,599	0	363	0	119	0
Total	3,562	465	5,979,047	1,461,345	2,649,059	377,784	292,622	162,704	97,395	36,104

4. 9:00 am - 10:00 am

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	93	13	70,272	9,579	47,704	11,796	2,755	684	2,362	839
02. Chicago balance	612	35	399,523	33,889	302,016	26,191	13,347	3,289	10,707	2,205
03. Cook Co. balance	1,183	4	502,073	3,819	649,987	3,185	12,063	228	15,565	186
04. DuPage Co.	488	0	187,069	0	274,725	0	4,198	0	6,160	0
05. Kane Co.	171	0	81,278	0	43,396	0	1,578	0	852	0
06. Kendall Co.	12	0	2,641	0	2,929	0	44	0	49	0
07. Lake Co.	349	0	167,635	0	129,393	0	3,721	0	2,810	0
08. McHenry Co.	55	0	17,215	0	11,918	0	297	0	205	0
09. Will Co.	589	0	228,304	0	168,700	0	4,247	0	3,095	0
10. Grundy Co. part	10	0	3,837	0	2,946	0	66	0	51	0
Total	3,562	52	1,659,847	47,287	1,633,714	41,172	42,316	4,201	41,856	3,230

Table B-4. 2030 Expressway Data (continued)

5. 10:00 am - 2:00 pm

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	93	6	309,018	21,266	166,362	21,389	11,820	1,422	7,455	1,449
02. Chicago balance	598	19	1,631,739	92,932	1,016,182	51,882	59,367	18,156	35,143	6,828
03. Cook Co. balance	1,183	2	2,325,549	9,101	2,114,417	5,374	52,617	577	48,121	341
04. DuPage Co.	488	0	907,656	0	894,827	0	19,750	0	19,459	0
05. Kane Co.	171	0	375,414	0	139,078	0	7,048	0	2,652	0
06. Kendall Co.	12	0	13,448	0	8,354	0	222	0	138	0
07. Lake Co.	349	0	733,596	0	410,260	0	15,333	0	8,529	0
08. McHenry Co.	55	0	82,470	0	35,941	0	1,417	0	615	0
09. Will Co.	589	0	1,068,983	0	530,100	0	19,705	0	9,585	0
10. Grundy Co. part	10	0	13,991	0	8,442	0	234	0	141	0
Total	3,548	27	7,461,864	123,299	5,323,963	78,645	187,513	20,155	131,838	8,618

6. 2:00 pm - 4:00 pm

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	95	32	207,350	74,100	83,428	39,359	11,419	6,269	4,752	2,901
02. Chicago balance	609	49	1,113,888	133,231	516,697	62,554	59,715	29,743	23,106	8,855
03. Cook Co. balance	1,183	12	1,504,950	32,685	1,127,368	15,172	38,380	2,604	28,103	1,085
04. DuPage Co.	488	0	589,412	0	486,564	0	14,112	0	11,415	0
05. Kane Co.	171	0	219,661	0	75,556	0	4,467	0	1,550	0
06. Kendall Co.	12	0	8,263	0	4,122	0	137	0	69	0
07. Lake Co.	349	0	479,164	0	218,116	0	11,270	0	4,946	0
08. McHenry Co.	55	0	48,483	0	21,049	0	841	0	364	0
09. Will Co.	589	0	651,095	0	296,910	0	12,483	0	5,579	0
10. Grundy Co. part	10	0	7,860	0	4,783	0	133	0	81	0
Total	3,561	93	4,830,126	240,016	2,834,593	117,085	152,957	38,616	79,965	12,841

7. 4:00 pm - 6:00 pm

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	95	47	290,770	174,178	30,401	15,693	29,073	24,652	2,165	1,612
02. Chicago balance	609	98	1,522,547	368,352	201,548	30,370	75,819	38,328	8,190	3,045
03. Cook Co. balance	1,183	37	2,281,953	132,187	491,254	16,704	63,095	9,572	12,615	1,181
04. DuPage Co.	488	11	899,022	37,846	206,856	4,856	24,696	2,637	5,190	329
05. Kane Co.	171	13	305,086	45,259	31,361	3,888	7,769	2,076	762	178
06. Kendall Co.	12	0	12,724	0	1,724	0	210	0	28	0
07. Lake Co.	349	33	721,403	121,163	94,083	9,657	23,135	8,000	2,659	644
08. McHenry Co.	55	0	64,927	0	8,679	0	1,113	0	148	0
09. Will Co.	589	2	919,153	7,716	129,361	48	19,352	642	2,523	4
10. Grundy Co. part	10	0	9,742	0	2,036	0	161	0	34	0
Total	3,561	241	7,027,327	886,701	1,197,303	81,216	244,423	85,907	34,314	6,993

8. 6:00 pm - 8:00 pm

	Lane Miles		Vehicle Miles Traveled				Vehicle Hours Traveled			
	Total	Congested	Total Auto VMT	Congested Auto VMT	Total Truck VMT	Congested Truck VMT	Total Auto VHT	Congested Auto VHT	Total Truck VHT	Congested Truck VHT
01. CBD	95	0	238,290	0	10,987	0	8,724	0	378	0
02. Chicago balance	609	2	1,137,676	7,343	62,798	103	28,080	624	1,479	7
03. Cook Co. balance	1,183	0	1,360,051	0	115,999	0	26,983	0	2,282	0
04. DuPage Co.	488	0	493,013	0	48,387	0	9,718	0	946	0
05. Kane Co.	171	0	215,409	0	7,591	0	3,842	0	136	0
06. Kendall Co.	12	0	8,711	0	460	0	139	0	7	0
07. Lake Co.	349	0	429,909	0	22,624	0	8,379	0	439	0
08. McHenry Co.	55	0	45,515	0	1,892	0	755	0	31	0
09. Will Co.	589	0	549,663	0	27,731	0	9,612	0	475	0
10. Grundy Co. part	10	0	6,528	0	396	0	104	0	6	0
Total	3,561	2	4,484,765	7,343	298,865	103	96,336	624	6,179	7

APPENDIX C

CATS Transportation Opinion Survey

Transportation Opinion Survey

Dear Resident,
The purpose of this survey is to obtain some general information on how you use the transportation system in northeastern Illinois. Thank you for participating in this survey.

1. What types of transportation do you typically use?
   (please check all that apply)

   ____ Auto/Van/Pickup/SUV
   ____ Passenger in Auto/Van/Pickup/SUV
   ____ Bus (CTA/Pace/Paratransit)
   ____ CTA EL/Subway
   ____ Metra Commuter Rail
   ____ Bicycle
   ____ Walk
   ____ Taxi
   ____ Other (specify) ____

2. What types of problems have you observed or experienced in your daily travel?

   2A. Traffic related problems
   (please check all that apply)

   ____ Traffic congestion
   ____ Roads in bad condition
   ____ Intersection delays
   ____ Railroad crossing delays
   ____ Inadequate signage
   ____ Other (please specify)
   ____
   ____

   2B. Public transportation related problems
   (please check all that apply)

   ____ It doesn't serve the area where I live
   ____ It doesn't serve the places I need to travel to
   ____ It is too slow
   ____ It is too expensive
   ____ Service is infrequent
   ____ I don't feel safe
   ____ I don't have information about available service
   ____ Other (please specify)
   ____
   ____

   2C Problems with other types of transportation.
   ____
   ____
   ____

3. Please tell us what you like about the transportation system in northeastern Illinois. Feel free to comment on all types of transportation.
   ____
   ____
   ____
   ____
   ____
   ____

4. Are you employed?

_____ Yes   ______ No   ______ Retired

5. If you are employed, can you to get to work using public transportation?

_____ Yes   _____ No   _____ Don't Know

6. If you are employed, do you ever use public transportation for non-work purposes?
_____ Yes   _____ No

7. Are you a student at a university or community college in the Chicago area?

_____ Yes   _____ No

8. If yes, can you get to school using public transportation?

_____ Yes   _____ No   _____ Don't Know

9. If you drive to school, do you have a problem finding a place to park?

_____ Yes   _____ No   _____ I don't drive to school

10. How do you currently receive your transportation information? (Check all that apply)

_____ Radio   _____ Internet

_____ Television   _____ RTA/CTA/Pace/Metra

_____ Newspaper   _____ I do not receive any transportation information

_____ Other (specify) ____

11. How would you prefer to receive your transportation information?
____
____

12. Sex: ____ Male   _____ Female

13 What year were you born? ________

14. What is your home Zip Code? _________

15. What is the Zip Code at your place of work? _________

In your opinion, what can be done to improve the transportation system in northeastern Illinois. (Please consider improvements to all types of transportation).
____
____
____
____
____
____
____
____

Would you like to participate in future transportation surveys?

______ Yes   ______ No

If yes, please print your name and address and/or telephone number, and/or e-mail address in the space below.

____
____
____

Thank you for your cooperation.

APPENDIX D

HPMS Analysis Locations

Nearest City	County	Lanes		Location	Functional Class
Fox Lake	Lake	4	N-S	US 12 1.0 mile south of IL 134	Other Principal Arterial
Bartlett	Cook	4	N-S	IL 59 0.4 mile north of US 20	Other Principal Arterial
Markham	Cook	4	N-S	Pulaski rd 0.1 miles south of US 6	Minor Arterial
Dolton	Cook	4	E-W	IL 83 (E. Sibley Blvd.) West of Minerva Ave.	Other Principal Arterial
Palos Park	Cook	2	N-S	IL 7 (Southwest Hwy.) NE of West 131st St.	Minor Arterial
Oak Lawn	Cook	6	N-S	IL 50 (Cicero Ave.) South of 99th Street	Other Principal Arterial
LaGrange	Cook	2	E-W	West Cossitt Ave. East of Sunset Ave.	Collector
Melrose Park	Cook	6	N-S	US 45 (Manheim Rd.) South of Armitage Ave.	Other Principal Arterial
Elk Grove Village	Cook	4	E-W	Devon Ave. West of Ridge Ave. and Mittel Blvd.	Minor Arterial
Rosemont	Cook	4	E-W	IL 72 (Higgins Rd.) West of the I-294 overpass.	Collector
Lincolnwood	Cook	3	NNS	N. Kedzie Ave. South of W. Touhy Ave.	Collector
Morton Grove	Cook	4	E-W	IL 58 (Dempster) West of Birch Ave.	Other Principal Arterial
Arlington Heights	Cook	4	E-W	US 14 (Northwest Hwy.) NW of Arthur Ave.	Minor Arterial
Northbrook	Cook	4	N-S	IL 43 (Waukegan Rd.) NW of Techny Dr.	Other Principal Arterial
Wheeling	Cook	4	N-S	IL 68 (Dundee Rd.) East of Portwine Rd.	Other Principal Arterial
Woodridge	DuPage	4	N-S	IL 53 .02 mile south of 75TH st.	Other Principal Arterial
West Chicago	DuPage	4	E-W	IL 64 0.9 mile west of il 59	Other Principal Arterial
Glen Ellyn	DuPage	4	E-W	IL 38 (Roosevelt Rd.) West of Finley Rd.	Other Principal Arterial
Hinsdale	Dupage	4	N-S	IL 83 (Kingery Hwy) North of 55th Street overpass	Other Principal Arterial
Wood Dale	DuPage	4	N-S	Wood Dale Rd. North of Thorndale Ave.	Minor Arterial
Batavia	Kane	4	N-S	IL 31 1.2 miles north of IL 56	Minor Arterial
Gilbert	Kane	2	N-S	Galligan Rd. South of Freeman Rd.	Minor Arterial
St. Charles	Kane	2	E-W	Campton Hills Dr. West of Peck Rd.	Collector
Milburn	Lake	2	N-S	US 45 0.9 mile south of IL 173	Other Principal Arterial
North Chicago	Lake	4	E-W	IL 131 (Green Bay Rd.) South of Argonne Dr.	Minor Arterial
Barrington	Lake	2	N-S	IL 59 (Hough Rd.) South of Cresthill Rd.	Other Principal Arterial
Ingleside	Lake	2	N-S	Wilson Rd. S. of Marquette.	Minor Arterial
Mundelein	Lake	2	E-W	IL 176 East of Blue Spruce Rd.	Minor Arterial
Libertyville	Lake	2	E-W	Lake Street West of West St.	Collector
Crystal Lake	McHenry	4	N-S	IL 31 0.3 mile south of US 14	Other Principal Arterial
Frankfort	Will	4	N-S	US 45 1.3 miles north of US30	Other Principal Arterial
Romeoville	Will	4	N-S	IL 53 (Independence Blvd.) North of Taylor Rd.	Other Principal Arterial
Plainfield	Will	2	E-W	IL 126 NE of E 143rd Street	Minor Arterial
Lockport	Will	2	E-W	163rd Street West of S. Peppermill Tr.	Collector